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REVIEW

A systematic review of disability awareness interventions for children and youth

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Purpose: Children's lack of knowledge about disability can adversely impact their attitudes toward people with disabilities. The purpose of this study is to review the common elements of effective disability awareness interventions. *Methods*: A systematic review of disability awareness interventions for children and youth was conducted to assess the effective components of these interventions. Electronic searches were conducted using OVID, CENTRAL, PsychInfo, ERIC, Social Science Citation Index, GreyNET Scopus and Google Scholar. The inclusion criteria included (i) an intervention raising awareness about disability, (ii) school-age children with the average age between 5–19 years old, (iii) at least one measurable outcome focusing on knowledge about disability or attitudes towards and/or acceptance of people with a disability and (iv) published article or grey literature. *Results*: Of the 1031 articles that were identified in the search, 42 met the criteria to be included in the review. We classified the disability awareness interventions into 5 broad types including (i) social contact, (ii) simulation, (iii) curriculum, (iv) multi-media curriculum and (v) multiple components. Thirty-four studies showed an improvement in attitudes towards and/or acceptance of peers with disabilities. Eight of these studies also demonstrated an improvement in knowledge of people with disabilities. Five of the interventions found no support for improving knowledge about, or acceptance of people with disabilities. *Conclusion*: Disability awareness interventions can successfully improve children's knowledge about and attitudes towards peers with a disability; they should include several different components over multiple sessions. *Relevance*: These findings are being used to further develop disability awareness interventions to help improve the social inclusion and participation of children with disabilities within mainstream classrooms.

Keywords: Children, disability awareness, intervention, review, school-age, youth

Implications for Rehabilitation

- Well-designed disability awareness interventions for children and youth can help improve knowledge about disability, attitudes towards people with a disability and acceptance of peers with a disability.
- Rehabilitation health care providers and educators should be trained to recognize when children with disabilities are being socially excluded and be prepared to provide or recommend appropriate resources and interventions on how to address this issue.
- Clinicians, educators and children with disabilities should all be involved in the development of disability awareness programs.
- Educators should carefully choose an appropriate intervention to meet the needs of the children in their class while considering age appropriateness and diversity of the students. It is also important for educators to be cognizant of the broader societal influences that impact attitudes towards disability.

Introduction

Improving inclusive environments within classrooms is especially critical for children with disabilities because of the increased prevalence of inclusive education (i.e. children who spend most or all of their time being schooled with their typically developing peers). Evidence consistently shows that being placed in an integrated classroom does not guarantee that children with disabilities will be accepted, valued and included [1–3]. For instance, nearly fifty percent of children with disabilities feel that they do not belong within their class, feel lonely, isolated and unsafe [4,5]. This is concerning because there are over 200,000 Canadian children and youth

living with a disability [6], the majority of whom attend integrated classrooms and are at an increased risk for social exclusion and bullying [4,7,8].

Children's adverse attitudes toward peers with disabilities have been widely documented in preschool, elementary and secondary school settings [1,9]. Research demonstrates that children often only interact with peers who have a disability in structured settings where they are encouraged to do so [3,4]. Favazza et al. [10] found that without supportive programs children often have low acceptance of peers with disabilities. For example, a meta-analysis of 20 studies found that children aged 3–12 years old preferred being in proximity to typically developing peers compared to children with disabilities [11].

Children's attitudes towards their peers with disabilities are often strongly influenced by their degree of knowledge about disability, which stems from their social environments [3,7,12,13]. Adverse attitudes and social exclusion are often the result of children's lack of knowledge about disabilities [2,3]. Given that perceptions of disability often shape attitudes and behaviours, it is vital to improve children's understanding of people with disabilities [13,14]. One key mechanism of improving attitudes is through disability awareness interventions.

Importance of disability awareness and social inclusion at school

The social inclusion of all children is critical. According to the UN Convention on Rights of the Child [15] all children "should enjoy a full and decent life, in conditions which ensure dignity, promote self-reliance and facilitate the child's active participation in the community." Thus, most integrated schools place emphasis on belonging, acceptance and supportive peer relationships [16]. The provision of inclusive and accepting social climates within schools is necessary to decrease the likelihood that children will be socially excluded from their peers [16]. This is particularly important because children who are victims of social exclusion often experience adverse physical, mental and social consequences such as depression, anxiety and low self-esteem [8,17,18]. It is critical therefore, to help improve the social inclusion of children with disabilities because acceptance and a sense of belonging are essential to a child's social and academic development and overall quality of life [3,4,19,20]. For integrated classrooms to be successful, children need opportunities to learn more about social inclusion and people with disabilities through ongoing learning opportunities in a co-operative environment [4]. One key mechanism of improving inclusive environments is through social inclusion and disability awareness interventions, which can help children to develop respectful attitudes toward individual differences [21].

Disability awareness interventions

Interventions aimed at increasing children's disability awareness within mainstream classrooms can help improve knowledge, attitudes and acceptance of people with disabilities [21–23]. There have been a wide variety of formats of disability awareness interventions including providing information about disabilities [23,24], videos [25], drama [26], theatre and puppet shows [20,26–28], discussions [26], stories [29], simulations [30,31], structured interactions [10] and classroom activities [32,33] among others [34,35]. The outcomes of such disability awareness interventions are mixed. For example, some researchers [24,34] have found a positive change in attitudes toward people with disabilities following a disability awareness intervention, while others [23] have reported that there was no change.

Despite the growing literature on the inclusion of children with disabilities in mainstream classrooms and the subsequent increase in disability awareness interventions, the common elements of the effective components have not been synthesized and remain largely unknown. Indeed, little attention has been paid to effective strategies to promote positive attitudes towards their peers with disabilities [36]. It is critical that disability awareness interventions are effective so that they can provide typically developing children with opportunities to learn and develop positive attitudes about differences in a respectful context [37,38]. Helping children nurture such attitudes at school can contribute to the creation of a positive social climate among children and youth [4,37]. Addressing attitudes towards people with disabilities in childhood is important because at this age their attitudes are still evolving and early interventions may be especially beneficial [27,34]. This review aims to synthesize the common characteristics of effective disability awareness interventions for children and to make recommendations for their further development.

Method

The objective of this systematic review is to critically appraise the evidence of disability awareness and social inclusion interventions for children and youth.

Research questions

(1) What are the common elements of effective disability awareness interventions for children and youth? and (2) What recommendations can be made for further development of disability awareness programs?

Search strategy

The following databases were searched for relevant articles in English published from 1980–September 2011: CINAHL, MEDLINE(OVID), Healthstar (OVID) PubMed, EMBASE, Web of Science, Cochrane Databases for Systematic Reviews, Cochrane Central Register of Controlled Trials (CENTRAL), ERIC, PsychInfo, Social Science Citation Index, Scopus, GreyNet, Conference Proceedings, and Google Scholar. The search strategy involved using the following subject headings and search terms: "disab* awareness", and/or "social inclusion" were combined with "attitude" and/or "outcome." The "similar article" function and manual cross-referencing from identified studies were used to enhance the search.

The inclusion criteria involved (i) an intervention to raise awareness about disability or to enhance social inclusion for people with disabilities; (ii) school-age children and youth

with the majority of the sample or average age between 5–19 years old; (iii) at least one measurable outcome focusing on knowledge about disabilities, or attitudes towards people with disabilities; and (iv) published or grey literature from 1980–September 2011. These criteria were chosen because childhood is an ideal time to help develop positive attitudes towards people with disabilities. This date range was chosen because research on this topic has dated back to the early 1980s when inclusive education policies started being implemented.

Through this search process 1031 articles were identified and two people reviewed the titles and abstracts of these articles. Nine hundred and forty-seven articles were eliminated based on their title or abstract not being related to the current search. After removing duplicates and applying the inclusion criteria 42 articles remained in the final analysis. Full articles were then retrieved and evaluated for relevance.

Data abstraction and classification process

Data from the included studies were extracted and compiled by one author and independently verified by another investigator using a structured abstraction form that was based on previously completed systematic reviews [38]. Each article that met the inclusion criteria was read in its entirety by both authors before summarizing the key attributes. The first author kept a journal of decisions as part of an audit trail to ensure the study's conformability. These journal entries were used to formulate discussion points for meetings between the authors.

Articles were summarized and coded by the second author and then checked by the first author and a research assistant. A list of all the key themes was developed and a constant comparison method was used to facilitate the distinction of patterns, variations and relationships [39]. Data elements were compared and critiqued and the commonalities were summarized and evaluated. After the initial analysis was complete both authors reviewed the key themes identified and minor adjustments were made until consensus was reached. This review method is compatible with the use of varied data from diverse methodologies [40].

The articles were classified into a hierarchy of evidence based on the rigour of their methodology. We used the American Academy of Neurology's classification of evidence for therapeutic intervention [41]. A summary of this classification system involves the following: (class I) randomized controlled trials meeting rigorous; (class II) matched prospective cohort studies or RCT in a representative population lacking on of the criteria in class one; (class III) all other controlled trials; (class IV) all other studies that did not meet the criteria for class I to III [41]. Recommendations for the effectiveness of the interventions to improve knowledge and attitudes were based on the strength of evidence of all articles [41].

Results

A total of 42 studies were included in the review. Table I provides an overview of the study characteristics including sample, purpose, design, components of the disability awareness interventions, results and limitations of the studies. In terms of the focus on the intervention, 11 focused on disability in general, followed by physical disabilities (10), mental illness (7), several disabilities (6), autism (2), intellectual disability (2) and 1 article focusing on each one of the following conditions: schizophrenia, Tourette Syndrome, cerebral palsy and visual impairments. Sample sizes ranged from 3 to 2081. The average ages of the children involved in these studies ranged from 5 to 19 years old. Many of the studies did not contain detailed demographic information about their sample so it is difficult to make comparisons between the articles in this respect. Of the studies that gave details about the gender composition of the sample, they were roughly equal in terms of males and females in most studies.

A wide variety of standardized measures were used to evaluate the effectiveness of the interventions (refer to Table I). The majority of the studies focused on measuring attitudes towards people with disabilities (e.g. Chedoke-McMaster Attitudes Toward Children with Handicaps (CATCH), Peer Acceptance Scale, Peers Attitudes Toward Handicapped (PATH), Acceptance Scales for Kindergartners (ASK), Children's Attitudes Toward Integrated Physical Education-Revised (CAIPE-R)), acceptance of people with disabilities (e.g. Children's Social Distance from Handicapped) and behaviour (Personal Contact with Disabilities Scale) followed by knowledge of disability (e.g. Children's Knowledge About Handicapped Scale). Several other non-standardized measures were also used.

The majority of the studies (32) did not have a theoretical framework to inform their intervention. Of the studies that did have a theoretical framework they included such theories as behaviour change theory [42], theory of planned behaviour [24,43,44], social learning theory [24,43], social contact theory [16,34], social model of disability [22], social desirability and attribution theory [23], theory of mere exposure effect [3], theory of persuasive communication and social cognitive theory [3,16], cognitive behavioural theory [7,16], models of attitude change [45], and interpersonal relations theory [45].

First, we provide an overview of the overall effectiveness of the interventions by the type of outcome measured. Next, we outline common components of the effective interventions. Finally, we highlight key lessons learned and make recommendations for the further development of disability awareness interventions.

Effectiveness of the interventions

There were two broad outcomes that these interventions measured: (i) knowledge of people with disabilities and (ii) attitudes towards and acceptance of peers with disabilities. Overall, the majority of the studies (34) showed significant improvements in attitudes towards children with a disability as well as improvements in knowledge about people with disabilities (8 studies) (refer to Table II). Five studies did not demonstrate a significant improvement in knowledge or attitudes following the intervention.

Attitudes towards and acceptance of people with disabilities

A key outcome among the studies we reviewed involved attitudes towards and acceptance of people with a disability.

Table I. Study characteristics.

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Theory	Objective	Study design	Measure	Type of intervention	Key findings (level of evidence)	Limitations of study
								Social contact		
Armstrong et al., 1987 (Canada)	(n/a) 87	9–13 years old (public school, segregated classes)	Physical disabilities	N/a	To evaluate the effectiveness of a "buddy" program designed to improve attitudes of non-disabled children towards physically dis-abled children	Randomized control trial (46 buddies, 45 controls)	Chedoke-McMaster Attitudes Toward Children with Handicaps (CATCH); Perceived Competence Scale; Parental Attitudes Toward Children with Handicaps (PATCH)	• Assigned a buddy of the same gender (with a disability) • Meet weekly for 3 months, opportunity for social interaction, no academic elements	• Significantly improved attitudes towards children with disabilities (Class II)	• Each school developed their own program (not standardized across schools) • Little known about long term impact • Most buddies were female
Marmon et al., 2007 (Israel)	170 (n/a)	Mean age 10.5 years	Disability (general)	Contact theory (Allport 1954)	To assess to what extent a direct contact program (Partners to Inclusion) changed the general education students' attitudes towards children with disabilities	Quasi experimental design (non-equivalent control group)	Attitudes towards children with disabilities (based on Siller et al.'s (1967) measure; Children's Self-Efficacy Scale (Bandura 1989)	• 1-year program provided direct contact with students with disabilities through weekly or bi-weekly joint activities lasting 30–90 min • mean # of direct contact meetings was 16.75	• Significantly improved disability-related attitudes and specific self-efficacy improved over time (Class III)	• Participants weren't randomly assigned • Control and experimental groups were not systematically matched
Newberry and Parish, 1987 (US)	456 (49% female)	8–11 years old	Mental, physical and intellectual disabilities, hearing	N/a	To explore social interaction outside the classroom; to assess if there were attitudinal benefits for children with and without disabilities to interact at a weekly scout meeting	Pre-and post-tests; randomly assigned environmental and control groups	Personal Attribute Inventory for Children	• 6 weeks × 1 h per week • 10 groups, 5 included 1 member with a disability	• Direct social contact can foster increased acceptance and more positive attitudes (Class III)	• Labelling of the disabled child • Only one child in each scout troop had a disability
Piercy et al., 2002 (New Zealand)	51 (43% female)	5–7 years old (6 boys from seg-regated class; remainder from mainstream class)	Intellectual disabilities	N/a	To understand the impact of a cooperative-learning program on the social acceptance of children with moderate to severe learning disabilities	Randomly assigned to one of 3 groups (co-operative learning group, social contact group, control); pre-post test	Peer-Acceptance Scale, Popularity Index, Social-Dis-tance Scale, Behaviour Observations	• 10 week program • Cooperative learning group, social-contact group	• Significantly increased positive interactions between children with and without intellectual disabilities (Class III)	• Unknown whether cooperative-learning is better embraced by younger children

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Social contact		
Frederickson and Turner, 2003 (UK)	20 (5% female)	6–12 years old (integrated classes)	Emotional and behavioural difficulties	Comparison/control group; randomized (between group deigns)	Sociometric Rating Scale; Self-Perception Profile for Children; Teacher's Ratings Scale of Child's Actual Behaviour; My Class Inventory	N/a	To evaluate two small interventions, and observe the impact of Circle of Friends on various aspects of a child's social competence	• Phase 1: Circle of Friends for 6 weeks • Phase 2: just students who had not participated in Circle of Friends; 6 weekly meetings (first by ed. psychologist, rest by school), within-subjects design	• Significantly improved perceptions about disabled child • Intervention had positive effects on social acceptance by classmates (Class III)	• Potential for negative labelling for the disabled child • Small size of study group
Barrett and Randall, 2004 (UK)	6 (33% female)	Grades 3/4 (inclusive school)	Disabilities (general)	Pre-test, post-test questionnaire	Sociometric questionnaire	N/a	To investigate an adapted version of the Circle of Friends program	• 6 weeks (1 × week for 30 min) co-led by an Educational Psychologist and teacher • Structure: warm up activity, main activity, relaxation exercise • Model 1: circle of friends around the child (child not present in class discussion); Model 2: child with disability is included in class discussion when circle of friends is introduced; Model 3: circle of friends is set up around more than one child in the class.	• Improved children's perceptions (in the whole class contact group) (Class IV)	• Short term intervention • Whole class context not addressed
Whitaker et al, 1998 (UK)	(n/a) 52	10–14 years old (mainstream school)	Autism	Interviews and questionnaire	not given	N/a	To facilitate interactions for the identified child with other children; to reduce the perceived impairment for the identified child; recognize the impairment of social skills for children with disabilities; and to address specific individual problems	• circle of friends approach • 4 main steps: establishing prerequisites, discussion with the class, establish a circle, weekly meetings of the circle • Meeting 1: led by Autism Outreach Team, teacher selects 6–8 circle members	• Significant improvements in interactions with children with disabilities (Class IV)	• Some children became upset or distressed when the identified child reacted unexpectedly or intensely • No control group

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Simulation		
Pivik et al., 2002 (Canada)	(n/a) 60	9–11 years old	Physical disability	Controlled pre-test, post-test design; random	The Knowledge Questionnaire; Children's Social Distance from Handicapped Persons Scale	N/a	To assess the effectiveness of a virtual reality computer game to educate children about accessibility and attitudinal barriers	• 30 min, desktop virtual reality program; children viewed game as if they were sitting in a wheelchair (experienced obstacles, stairs, narrow doors, objects too high to reach, etc)	• Program was effective for increasing children's knowledge of accessible barriers • Grades 5–6 showed greatest change; no gender differences in knowledge of barriers but males had higher post test attitude score (Class II)	• Accessible school and may have already had positive attitudes
Hutzler et al., 2007a (Israel)	75 (41% female)	7–10 years old	Physical disability	Questionnaire	Attitudes Towards Peers with Disability; Children's Attitudes Towards Peers with Disability Scales	Theory of planned behaviour; social learning theory	To determine the effect of the Children's Attitudes Towards Peers with Disability Scales and an elite wheelchair basketball game on altering children's attitudes toward their peers with disabilities	• 1 h simulated movement activities followed by a discussion • Children were assigned a simulated disability	• Improved attitudes towards including children with disabilities (Class IV)	• No control group
Hutzler et al., 2007b (Israel)	(n/a) 121	Grades 10–11	Physical disability	Questionnaire	Attitudes Towards Peers with Disability	Theory of planned behaviour; social learning theory	To determine the effect of the Children's Attitudes Towards Peers with Disability Scales and an elite wheelchair basketball game on altering children's attitudes toward their peers with disabilities	• 3 × 3 demonstration from elite wheelchair basketball players versus the school team who sat on extra wheelchairs • Athletes then introduced themselves and told the crowd about themselves as well as their team	• Improved attitudes for both genders, and only girls behaviourally (Class IV)	• No control group

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Table I. (*Continued*).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
Loovis and Loovis, 1997 (US)	430 (51% females)	Grades 2–6	Disability (general)	Pre-post design (no control group)	CATCH	N/a	To measure the efficacy of simulated experiences with a variety of disabilities on the attitudes of elementary school students	**Simulation** • In physical education, small groups of students spent 5 min each in: finger spelling and sign language exercises, orientation and filling a knapsack while using kitchen tongs, manoeuvrability through an obstacle course in a wheelchair, word scrabble and sentence recognition and writing with a pencil and picking up coins wearing gloves with tissue stuffed in the fingers.	• Girls attitudes towards peers with disabilities changed significantly (Class IV)	• No control group
Godeau et al., 2010 (France)	784 (58% female)	12–13 years old (mostly high socio-economic status)	Disability (general)	Randomized, control group	CATCH Questionnaire; HBSC Family Affluence Scale; KID-SCREEN-52; Multinational Study of Attitudes Toward Individuals with Intellectual Disabilities	N/a	To assess the effectiveness of an intervention on the attitude of 7th grade students toward their peers with a disability and identify personal or environmental factors associated with attitudes held by students and method to improving attitudes	**Curriculum** • Teachers and staff attended a film on inclusive education and then participated in a debate mediated by the research team • Teachers were then asked to organize several lessons that included the educational material provided by the researchers (film, exercises, inclusive education policy, role plays and a bibliography)	• After educational program no significant change in attitudes toward disability (Class I)	• Children who responded in pre and post test were more commonly associated with specific socio-economic factors
Rahman et al., 1998 (Pakistan)	100 (50% female)	12–16 years old	Mental health	Controlled design; pre-test, post test questionnaire	19 question questionnaire written in Urdu; based on unstructured interviews with locals	N/a	To assess a school based intervention to develop mental-health awareness for school children, their parents, friends and neighbours	• Participatory educational methods; awareness activities incorporated to daily activities including essays, plays, annual speech contests	• Significant change for students awareness of mental health issues (Class II)	• Fewer girls then boys attend school

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Theory	Objective	Measure	Type of intervention	Key findings (level of evidence)	Limitations of study
								Curriculum		
Battaglia et al., 1990 (US)	1380 (60% female)	Grades 6–12 (integrated classes)	Mental illness	Post-test questionnaire and control group	N/a	To evaluate the use of a mental illness awareness week program	Northumberland Country Council Pupil Questionnaire	45 min presentation given by 20 residents from a university psychiatry program	Attitudes toward psychiatrists were more positive for youth who had attended the presentation and more likely to seek help from psychiatrist (Class III)	Unsure if presentation changed help seeking behaviour • No follow-up
Holtz, 2007 (US)	179 (49% female)	Aged 7–15 years old (mean age 9.5 years); (4 public, 2 private schools) – 65% Caucasian, 8% African American, 5% Asian, 9% Hispanic, 13% Other ethnicity	Tourette's Syndrome	Pre- and post-test; randomized controlled trial	Behaviour change theory (Ajzen)	To determine the impact of an educational video on Tourette's Syndrome on the attitudes and knowledge of children	Knowledge Questionnaire; Chedoke-McMaster Attitudes Toward Children with Handicaps questionnaire	Video "You've Got a Friend" • Students in the control group watched a video called "Brainstorm: The Truth About Your Brain on Drugs," an unrelated informative video	Significant change in knowledge, attitudes, behavioural intentions and social acceptance (Class III)	Did not measure behaviour specifically • Unsure if the changes remained overtime;
Martinez, 2007 (US)	(n/a) 78	Grades 3–4 (Latino; urban; low SES)	Disability (variety)	Random assignment; experimental and control conditions; pre-and post-test	N/a	To address the attitudes of child before and after they had participated in a disability awareness program	Acceptance Scale: Elementary Level; About Me Demographic; What I Thought About the Book Questionnaire	6 sessions (5 week period); led by a school psychologist book discussing basic facts about the disability (Class I) • Discussion included: plot/content, explanation of disability, similarities between children with and without disabilities (5 books: blindness, autism, physical disability, intellectual disability and ADHD; 2 books general disability)	Significance influence on children's attitudes toward peers with special needs • Girls were more accepting of peers with special needs (Class III)	6 weeks may not have been a long enough period for intervention • Difficult to measure whether attitude change translated to behavioural and intentional change

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Table I. *(Continued)*.

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Curriculum		
Pitre et al., 2007 (Canada)	144 (55% female)	Grades 3–6	Mental health	Pre-and post- test; experimental and control groups (randomized)	Modified Opinions About Mental Illness Scale (OMI)	N/a	To alter the attitudes of children in regard to mental health stigmatization	• 3×45-min plays where puppets portrayed people with a mental illness (schizophrenia, dementia and depression/anxiety)	• Significantly improved attitudes towards mental illness (Class III)	• Smaller than intended study • One educational seminar unlikely to have long lasting impact • Teacher training recommended • Important that community is committed
Triliva et al., 2009 (Greece)	220 (48% females)	Grades 1–6	Disability (general)	Pre-post design with a comparison group	Modified version of Hazzard's (1983) scales to assess children's knowledge about people with disabilities	Social model of disability/ psycho educational	To assess the effectiveness of a program to sensitize elementary school students to issues related to disability	• 10 weeks × 1 h/week (activities included: learning about disability, barriers experienced, breaking down stereotypes)	• Students were sensitized to disability issues and reported more positive attitudes toward their disabled peers and higher levels of exposure/contact • Children had more correct information about disabled people and their capabilities (Class III)	• Not randomized
Binkard 1985 (US)	(n/a) 1989	Grades 4–6	Disability (variety)	Pre-post questionnaire	Non-standardized measures about views of children's views of disability	N/a	To explore the effectiveness of a disability awareness program	• 60-min puppet show presentation (~10 min scripts for each puppet that has a disability)	• 88% of children said they learned something new about disabilities; 94% liked the puppet show; 92% felt better about children with disabilities (Class IV)	• No control group; no significance tests; unstandardized measures
Essler et al., 2006 (UK)	(n/a) 104	13–14 years old (integrated classes)	Mental health	Non-controlled intervention; questionnaire quiz (pre and post test)	Mindout for Mental Health Quiz	N/a	To assess the effectiveness of a school-based intervention involving a professional theatre company to increase knowledge and positive attitudes of teenagers towards mental health	• *First phase:* quiz, drama, games which focused on mental health (Class IV) • *Second phase:* build self esteem and awareness of one's own attitudes, signs and symptoms of mental health (utilized games and stickers) • Trained facilitator, researcher and theatre company led	• Improved knowledge and attitudes towards mental health (Class IV)	• Cannot examine individual changes because the quizzes returned were anonymous • Only a proxy measure for attitude and knowledge • No control group

Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Theory	Study design	Measure	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Curriculum		
Kim, 2009 (Korea)	(n/a) 2081	Grades 5–6 (inclusive classrooms)	Disability (general)	N/a	Questionnaire, interviews	Non-standardized measures assessing attitudes towards children with disabilities; perceptions of the intervention	To assess whether a theatre-in-education presentation would enhance the awareness, perception and attitudes toward individuals with disabilities	• 40 min play, followed by a post-theatre workshop to discuss disability	• 71% attitudes improved • 85% found the play interesting • Common reactions included realism, authenticity, power of experience of disability (Class IV)	• Lack of standardized measure • Unsure long term implication
Micou, 2003 (US)	162 (48% female)	Grades 2 & 5 (75% Caucasian, 10% Hispanic, 7% Asian, 4% African American, 3% Middle Eastern, 2% Other 2%; middle-low income neighbourhoods)	Attention deficit, hyperactivity disorder (ADHD)	N/a	Analog study	Questionnaire (Based on White, Rubin & Graczyk; likability scale in the Pupil Evaluation Inventory, trait inferences from Revised Class Play and attributional dimensions)	To investigate children's perceptions of ADHD	• Participants were read 1 of 3 scenarios and showed the child illustrations • Children were then asked questions assessing the likability of the target individual	• Intervention provides support of effectiveness of a peer pairing program for altering attitudes of children towards their peers towards children with ADHD (Class IV)	• More than just association is needed to improve a child's social status
Nabors and Lehmkuhl, 2005 (US)	180 (50% female)	16–31 years old (mean age = 19); (Caucasian (153), African American (14), Hispanic (3), Asian (9), did not specify (1)	Cerebral palsy	N/a	Gender blocked, then randomly assigned to vignettes	Analogue design; Demographic Questionnaire; ROCQ Scale;	To examine factors influencing young adults' perceptions of children with cerebral palsy	• 20–30 min vignette	• Less positive perception of children with cerebral palsy compared to healthy children • Females had more positive perceptions of all children than males (Class IV)	• Analogue design limits the "real world" presentation of the material • More realistic to use pictures or video • Short vignettes only focused on physical limitations
Stuart, 2006 (Canada)	(n/a) 571	13–18 years old	Mental health	N/a	Pre- and post-test design;	Surveys adapted from several program sites in the World Psychiatric Association's global anti stigma program	To evaluate the effectiveness of using a video-based program to address the knowledge and attitudes of high school students in regards to schizophrenia	• *Lesson #1*: students share their current knowledge about schizophrenia before watching a 20min video • *Lesson #2*: role playing, the lesson material is accompanied by discussion	• Students were significantly more knowledgeable and less social distancing towards disabled peers (Class IV)	• Unsure about long term impact

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Table I. (*Continued*).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Curriculum		
Swaim, 2001 (US)	233 (50% female)	Grades 3 & 6 (middle-class, 93.6% Caucasian, 6.4% African American)	Autism	Analog study; stratified (race and gender), randomly to three conditions; follow up	Adjective Checklist, Shared Activities Questionnaire (SAQ-Self), modified Shared Activities Questionnaire (SAQ-Self), Similarity Rating Form (SRF)	Social desirability & attribution theory	To examine the attitudes and behaviours of children in grade 3 & 6 towards their peers with and without autism	• 3 conditions: No autism (n = 78), Autism (n = 77) and Autism & Info (n = 78) • After a brief introduction, video was shown to each group. Same boy was portrayed in all of the videos: in the first he interacted in a socially accepted manner, in the second he displayed autistic behaviours and in the third he displayed autistic	• Less positive attitudes toward peers with autism • Grade sixes and females, gave lower activity ratings to the child with autism as opposed to their typically developing peers • Providing information for children had no impact on their attitudes behaviours (Class IV)	• Behaviours of child actor were accurate, may not have conveyed spectrum of autistic behaviours
								Multi-media curriculum		
Adibsereshki et al., 2010 (Tehran)	221 (52% female)	Grade 3–5 (inclusive classes)	Physical disabilities	Pre-test, post-test, randomized control group	Acceptance Scale (Voeltz)	N/a	To investigate effectiveness of the program in regard to acceptance of students with physical disabilities	• 8 × 45 min sessions *Session 1*—story about individual differences; *Session 2*—movie about kids with disabilities; *Session 3*—movie promoting acceptance; *Session 4*—defining physical disabilities; *Session 5* Tools and equipment used by people; *Session 6*—disability and related activities; *Session 7*—communication problems; *Session 8*—how to help people with disabilities.	• Increased acceptance of students with physical disabilities • Girls had higher acceptance than boys • 5th graders had higher acceptance compared to younger grades (Class II)	• One scale • Not theoretically informed

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Multi-media curriculum		
Watson, 2004 (US)	1566 (52% female)	Grades 6–8 (1.9% Asian American, 2.6% African-American, 16.3% Hispanic, 1.2% Native American,.4 Pacific Islander, 69.8% Caucasian, 7.8% mixed ethnicity)	Mental illness	Pre-and post study design	The Knowledge Test (curriculum evaluation) and r-AQ (short-form Attribution Questionnaire)	N/a	To evaluate the impact participating in a curriculum based intervention about the science of mental on attitudes towards individuals with mental illness	• Uses print and web based activities to facilitate learning, through simulations, animations and videos	• Small but significant improvements in attitudes (Class II)	• No control group or follow up to see if the change was maintained • Hard to determine whether intervention had an impact on their actual behaviour
Hazzard and Baker, 1982 (US)	(n/a) 325	Grades 3–6 (60% Caucasian, 40% minority)	Disability (general)	Randomly assigned; pre and post tests	Children's Knowledge About Handicapped Person's Scale; Children's Social Distance from Handicapped Peers Scale; The Perception of a Handicapped Person Measure	N/a	To evaluate the impact of the multi-media program in changing/improving the attitudes of children towards their peers with disabilities; to facilitate mainstreaming in schools	• 6 × 45-min sessions (multimedia program) • Each session included 15 min film, discussion, classroom activity, book left in the classroom to be read in free time • 2 trainers led the sessions, but classroom teachers were encouraged to participate	• Significant increase in disability knowledge • greater awareness of appropriate behavioural responses to disabled peers • girls more positive then boys in terms of social distance, behaviour and intent to interact (Class III)	• Good first step, suggested to use in conjunction with another intervention • Only female trainers (suggest one male, one female)
Pinfold et al., 2003 (UK)	(n/a) 472	Grades 9–12	Mental health	Pre-and post study design (6 month post test)	Pretest Pilot Questionnaire	N/a	To assess the effectiveness of an intervention with young people aimed at increasing mental health literacy and challenging negative stereotypes associated with severe mental illness	• Workshops delivered by a trained facilitator; *Session 1:* 1-h mental health (video); *Session 2:* promoting well-being and challenging use of derogatory terms and labels; emphasis placed on removing distance between us and them; group exercises and information leaflets	• Greatest changes occurred for females attributed to contact with people who have mental illness • Mental health educational sessions are a successful manner to challenge stereotypical attitudes toward people with mental health issues (Class III)	• No control group for pre and post study • Social desirability bias in attitude assessments • Written views and expressed attitudes may not reflect any behavioural change

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Table I. *(Continued).*

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Multi-media curriculum		
Tavares, 2011 (Canada)	(n/a) 51	12–13 years old	Physical disability	Quasi-experimental group; pre- and post- test; follow up 1 month after post-test	Chedoke-McMaster Attitudes Toward Children with Handicaps Scale (CATCH); Social Interaction Questionnaires	N/a	To evaluate the influence of a presentation on the attitudes of children towards their peers with physical disabilities	• 45 min presentation • Knowledge is corrected or added to • Discuss similarities between the able bodied and disabled; video "Kids Just Want to Have Fun" • Presenters ask specific questions about the child's disability and the children answer the questions • Role playing	• More positive attitudes and greater understanding of disability • Short term positive impact on attitudes and potential on the social inclusion of the non-included child (Class III)	• Results not consistent across all schools • Too small of sample size to generalize • Intervention may have negatively impacted target child (felt over-whelmed or isolated) • Identification of child with disability – taken out of the classroom • Unsure about long term impact
								Multiple components		
Clunie-Ross and O'Meara, 1989 (Australia)	(n/a) 60	Grade 4 (integrated and non-integrated schools)	Intellectual disabilities and disability in general	Pre-test, post test (experimental group (30) and control group (30)	Peer Attitudes Toward the Handicapped Scale (PATHS): 3 sub-scales (physical, learning, behavioural) and a total score	N/a	To evaluate the effective-ness of a program to change the attitudes of primary school students towards children with disabilities in both inclu-sive and non-inclusive classrooms	Multi-media curriculum, simulation and social contact • 4 × 90 min sessions (over 2 weeks) • *Session 1*: movie, structured about barriers • *Session 2*: experiences in wheel chair • *Session 3*: story and video about differences and similarities • *Session 4*: social contact – 10 students with intellectual disabilities went roller skating with the grade 4 classes	• Significantly more positive attitude toward peers with disabilities by children in the experimental group • Throughout all phases the integrated had more positive attitudes (Class II)	• Effective in attitude toward disabled

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Multiple components		
Florian and Kehat, 1987 (Israel)	(n/a) 114	Grades 10–11 (heterogeneous cultural and socioeconomic backgrounds; urban centre)	Physical disability	Random assignment; 3 experimental groups, 1 control group	Jordan and Cessna's questionnaire (shortened version)	N/a	To examine the impacts of differently structured educational programs on high school students' attitudes toward individuals with physical disabilities; addressing how to change specific components of attitudes	Curriculum, simulation and social contact • *Group 1*: (n = 28), one meeting per week (lecture and discussion, role simulation; field trip) • *Group 2*: (n = 26), (lecture, discussion, role simulation in the community) • *Group 3*: (n = 31), (lecture, discussion, role simulation within the classroom, social contact) • *Group 4*: (n = 29) control group	• Group 2 significant change in attitudes • Group 3: change occurred but not statistically significant • Meeting with individuals with disabilities did not impact attitude • Important to rely on various methods and methodological combinations • Difference between 6 and 9 week program had no effect (Class II)	• Psychometric measure was not sensitive enough to evaluate valid impacts of the program's implementation • Technical difficulties with one group leaving the school to complete their tasks
Reina et al. 2011 (Spain)	344 (47% female)	10–15 years old (mean age 13.3)	Visual impairment	Quasi experimental design	Attitudes Toward Disability Questionnaire (ATDQ)	N/a	To explore the effect of two awareness programs (6-day versus 1-day programs) on children's attitudes toward peers with a visual impairment	Multi-media curriculum and simulation • 6-day program included: lecture and video on visual impairments, a game, simulated activities, training and competitive soccer using blindfolded goggles and a sport show • 1-day program included only the lecture and video	• Significant effects in the cognitive, emotional and behavioural scales • Significantly more females showed favourable results than males • The 6-day dyadic intervention was more effective than the 1-day awareness unit (Class II)	• This study did not take into account the impact of previous contact on knowledge of people with a disability
Rosenbaum et al., 1986 (Canada)	66 (45% female)	Grades 4–7 (9–13 years old)	Disability (general)	Quasi experimental (pre-test, post test with a control group)	Chedoke-McMaster Attitudes toward Children with Handicaps (CATCH): Perceived Competence Scale, Parental Attitudes toward Children with Handicaps (PATCH), Knowledge of Disabled People	N/a	To explore the effectiveness of two interventions for improving attitudes toward disability and more specifically children with disabilities - look at effectiveness of programs individually and collaboratively	Curriculum and social contact • Buddy program: 3 months • Kids On the Block: 10 weeks × 45 min, 4 puppet shows and discussions • Combined Kids On the Block & Buddy Program: both programs concurrently	• KOB and buddy group attitudes were significantly lower than the buddy only group • KOB-Buddy group was poorer then the control and KOB alone • Buddy only group knew more children with disabilities (Class III)	• Nature of buddy program differed f rom school to school • Need to define relationship between attitude and behavioural

(Continued)

Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
Rillotta and Nettelbeck, 2007 (Australia)	259 (55% female)	Grade 9–12 (private school)	Intellectual disability	Quasi experimental; age matched control groups	Attitudes Toward Persons with an Intellectual Disability Questionnaire;	Theory of mere exposure effect; theory of persuasive communication	To understand the impact of long-lasting positive attitudes regarding educational and social inclusion for people with an intellectual disability, through a social and educational integrated setting along with a program that provided training in disability awareness	**Multiple components** Multi-media curriculum and social contact • *Grade 6 Students:* 3 × 45 min sessions of disability awareness programs (included: getting to know students with an intellectual disability, touring their classroom, playing sports/cooking together, guest speaker discussing inclusion) • *Grade 8 students:* 8 × 45 min awareness of disability program ran by teachers (presentations, discussion, video, guest speakers, key element was non-disabled and disabled student interacting by planning and under taking an activity) • *Grade 8 students:* completed a 10 session program (similar to other group but 2 additional sessions with more direct contact and two videos)	• Students who completed an 8-session awareness program reported more positive attitudes toward people with disabilities than those who attended only 3 sessions • Similar positivity in attitudes in children who had just completed the sessions and those who had 8 years previously • Most promising for females (Class III)	• Schools differed in presentation, commitment and understanding
Schulze et al., 2003 (Germany)	(n/a) 150	14–18 years old	Schizophrenia	Pre-test, post test with a control group	Questionnaire (designed for this study: stereotypic views of schizophrenia and social distance	N/a	To reduce stigma and discrimination towards individuals with schizophrenia within a school environment	Multi-media curriculum and social contact • Used artwork and games to promote emotional wellbeing and mental health • Followed by discussion ways to cope with illness or when they feel 'down'; a young person with schizophrenia discussed their own stories	• Resulted in significant reduction of stereotypes (improved attitudes) (Class III)	• Attitudes are not the only factor to behaviour

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
Krahe and Altwasser, 2006 (Germany)	70 (63% female)	Grade 9 (mean age 14.8)	Physical disability	Experimental; randomized control group, 3 month follow up	Modified questionnaire About Attitudes Towards the Physically Disabled; Personal Contact with Disability Scale Developed; social desirability measure (Stober)	Cognitive behavioural; models of attitude change	To compare controlled interventions for altering attitudes towards individuals with disabilities	**Multiple components** Multi-media curriculum, simulation and social contact • 2 × 90 min sessions; *cognitive intervention:* personal experiences with disability, defining physical disability, taxonomy, labelling (video of Paralympic Games), historical overview, interacting with a person with a disability, dispelling stereotypes • *Behavioural intervention:* 9 physically disabled athletes came, taught and organized sports in the gym (goal-ball, wheelchair, basketb all and sitting volleyball)	• Combined cognitive-behavioural intervention had a more significant effect in improving attitudes than the cognitive intervention • Meeting individuals with a disability was key in dispelling stereotypes/myths (Class III)	• Unclear whether it was combination of cognitive-behavioural or just behavioural that had an impact
Panagiotou et al., 2008 (Greece)	178 (51% females)	Grades 5 and 6 mean age = 11.5	Physical disabilities	Experimental design	Children's Attitudes toward Integrated Physical Education—Revised (CAIPE-R)	Contact theory; persuasive communication theory; social-cognitive theory and interpersonal relations theory	To examine the effect of the Paraloympic school day program on the attitudes of 5th and 6th grade students without disabilities and the effect of gender differences on the inclusion of children with disabilities in physical education classes.	Curriculum and simulations • Paraloympic school day (1-day) that included 10 activities (15 min each): human rights, Paralympic games, boccia, classification, sitting volleyball, goal-ball, accessibility games, painting wheelchair basketball and athletics. • Students were separated into 10 groups (18–20 students in each group and then rotated among the activities)	• Significant difference in general attitudes toward peers with physical disabilities but not sport-specific attitudes • No gender differences (Class III)	• Theories were mentioned but not incorporated into the analysis

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
Xafopoulous et al., 2009 (Czech Republic)	71 (40% female)	Average age = 11.3	Physical disability	Pre–post design	Children's Attitude Toward Integrated Physical Education-Revised (CAIPE-R)	Theory of planned behaviour	To investigate the effect of Paralympic day on children's attitudes towards peers with a disability in general physical education class	**Multiple components** Social contact and simulations • 6 groups (12 students each) rotated into 6 activities (40 min each): (1) Paralympic sports (video and discussion), (2) sledge hockey (adapted equipment and practical exercise), (3) wheelchair mobility (experienced being different and moving in a different way) (4) wheelchair basketball, (5) meet an athlete with a disability, (6) boccia (the program emphasized respect and acceptance of individual differences, athletic achievements and rights of disabled people to take part in sports	• The one-day intervention positively influenced the general attitudes of girls but not their sport specific attitudes (Class IV)	• No control group
Favazza and Odom, 1997 (US)	46 (50% female)	5–6 years old (85% Caucasian, 15% African American; low SES) – integrated classes	Disability (general)	Randomized control group (pretest and post test)	Acceptance Scale for Kindergarteners (ASK), Inventory of Disability Representation (IDR), Opinions Relative to Mainstreaming (ORM)	N/a	To examine the effects of level of contact, books and discussions on the attitudes of kindergarten-age children toward people with disabilities	Curriculum and social contact • 9 week program divided into 3 groups (no, low and hig contact) • Equipment available for children to explore • 3 stories read each week in the high contact • 15 min of structured play with children with disabilities 3×/week	• Social contact and use of children's books are effective means to alter the attitudes of children (Class IV)	• Differences in contact groups could be related to school settings • Info about child's understanding or perception of a person with a disability was not assessed • Could have been strengthened by using behavioural observation

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Table I. (Continued).

First author, year (Country)	N (% female)	Sample characteristics	Type of disability	Study design	Measure	Theory	Objective	Type of intervention	Key findings (level of evidence)	Limitations of study
								Multiple components Curriculum and social contact		
Favazza et al., 2000 (US)	(n/a) 57	5–6 years old (2% Caucasian; 98% African American; low SES)	Disability (general)	Randomized control group (pretest and post test)	Teacher Impression Scale; Acceptance Scale for Kindergarteners (ASK); Inventory of Disability Representation (IDR)	N/a	To examine the effectiveness of an intervention to promote acceptance of young children with disabilities	• *Whole Intervention:* story time, discussions in classroom, structured play with children with disabilities, story time and discussions at home • *Story Group:* participated in story time part of intervention at home and school • *Play Group:* participated only in the structured play aspect of the intervention; story time and discussions centred around disability	• Children exposed to individual components of the intervention had short-term gains in acceptance of individuals with disability while children exposed to the whole intervention had short and long-term gains in acceptance • significant gains in levels of acceptance found only in the "high level of contact" groups (less exposure to people with disabilities was linked with lower acceptance (Class IV)	• Children in the control group were at a different school than the other 3 groups • Low reliability of ASK (due to self-reports) • Class was randomly assigned, not the individual students
Ison et al, 2010 (Australia)	147 (32% female)	9–11 years old (private schools; 2 Anglican, 1 Catholic school; 1 Boys school, 2 Co-ed)	Disability (general)	Pre-post test and focus group	Baseline questionnaire for this study (Likert Scale, True/False, Open Ended relating to presentation)	Cognitive behavioural	To evaluate the effectiveness of a short disability awareness package for students in 5th grade, to address gaps in knowledge, acceptance and attitudes toward people with disabilities	Curriculum, simulation and social contact • 2 × 90 min sessions held 1–2 weeks apart • At least one presenter had cerebral palsy • *information/cognitive activities:* (discussion, language use, Braille & ASL (finger spelling) and comprehension activity about Paraolympics) • *Participation activities* (simulation of daily activities with a disability, question and answer session with someone who had a disability and demonstration of common equipment)	• Improvements in knowledge and acceptance and attitudes towards individuals with disabilities • Focus group indicated that using interactive activities along with having a presenter with a disability were key to the positive outcomes (Class IV)	• Not a randomized controlled trial (schools requested to participate) • Unable to match data • Only included independent and Catholic schools

Unshaded: Class I and II; Light shaded: Class III; Dark shaded: Class IV.

Table II. Overview of effective disability awareness interventions by outcome.

Level of evidence	Knowledge about people with disabilities	Attitudes towards/acceptance of people with disabilities
Class I	N/a	N/a
Class II	• Simulations • Multi-media interventions	• Social contact interventions • Multi-media interventions • Multi-component interventions
Class III	• Curriculum interventions	• Social contact interventions • Curriculum interventions • Multi-component interventions
Class IV	• Curriculum interventions • Multi- component interventions	• Social contact • Simulation • Curriculum • Multi-component interventions

Legend of intervention effectiveness [41].
Unshaded: Probably effective (B); Light shaded: Possibly effective (C); Dark shaded: Data inadequate.

Thirty-four of the interventions we reviewed showed statistically significant improvements in attitudes toward and/or acceptance of people with disabilities (refer to Table II). In terms of the rigour of these studies six the interventions had class II level evidence [46–51], 17 studies with class III level evidence [1,3,4,16,22,27,34,42,45,52–57] and 15 studies with class IV evidence [7,10,20,23,24,35,36,43,44,58–63] (refer to Table II). The successful components of these interventions are discussed further in the 'components' section below.

Knowledge about disability

A second key outcome addressed by some studies was knowledge about people with disabilities. Upon examining the studies by level of rigour, one class II [30], four class III studies [22,33,43,64] and three class IV studies [7,60,62] found statistically significant improvements in knowledge about people with disabilities (refer to Table II). Within the class II study Pivik [30] used a simulation-based intervention involving a 30-min desktop virtual reality program where children had an opportunity to experience the world as if they were sitting in a wheelchair. Other interventions [64] involved six 45-min sessions (multi-media program) led by two trained people which involved films, discussion, activities and books to improve children's knowledge about disability.

Trilva et al.'s [22] intervention involved several curriculum-based activities, which took place for 1 h/week over 10 weeks. Rahman's [33] 4-month curriculum approach used participatory education methods and awareness activities to help improve children's knowledge about disabilities. Holtz's study [42] showed a video to raise awareness about disabilities. Overall, the evidence is a level C (refer to Table II), which means that these interventions are possibly effective at improving knowledge about disability. None of the studies that we examined showed a lack of improvement in knowledge about people with disabilities so we are unable to compare successful and unsuccessful components of interventions.

Three studies we reviewed had mixed results [28,35,64] which may be due to the studies comparing several different formats or interventions, in addition to having several different

outcome measures. An additional three studies in our review found that their intervention did not have a significant impact on improving attitudes or acceptance of people with disabilities [9,23,32]. Godeau et al. [32] suggest that this lack of effect may have been a result of improved attitudes in both the control and experimental group, thus, showing no overall effect. They contend that the introduction of any disability awareness intervention or questionnaire could lead students to reflect on their own personal interactions with a child with a disability [32]. With regards to the Nabors [9] study, their intervention was one of the only studies that compared the views of children with disabilities to typically developing children. Their sample also had a much older average age compared to the other studies in this review. In Swaim's study [23], they used three different conditions and also had multiple outcome measures, which could have accounted for their findings.

Effectiveness of interventions by gender and age

Notable gender differences were found in several studies where girls consistently had better attitudes towards peers with disabilities than males [1,3,9,24,32,44,51,57,59,64]. It is important to note, however, that the studies reporting gender differences were at a class III or IV level of evidence so the findings should be interpreted with caution (see Table II).

Some of the interventions found a difference in impact by age [23,30,49]. For example, one study found a difference in attitudes based on age of the children where those in grade 6 gave lower ratings to children with a disability (autism) compared to children in grade 3 [23]. In contrast, another study found that fifth graders had higher acceptance of peers with a disability compared to those in younger grades [49].

Components of the interventions

A main objective of our review was to explore the common components of disability awareness interventions. The number and type of components involved in the interventions varied greatly. They included such things as presentations [55], academic/curriculum based [9,32,33,60], stories [1,61], video [23] multi-media (i.e. more than one: stories, movies, art, games, role playing, discussions etc [3,4,7,42,45,49–51,56,60,62,64].), contact with a person with a disability [3,10,16,28,34–36,45,48,52–54,58], simulations [24,30,43,59] classroom activities [35,36,48], plays/puppet shows [20,27,28]. Many of the interventions combined several of these approaches.

We classified the various types of interventions into the following categories based on the mode of their delivery: (i) social contact; (ii) simulation; (iii) curriculum; (iv) multimedia curriculum and (v) multiple components.

Social contact

Seven of the interventions used a "social contact" approach where children were exposed to a person with a disability. One class II study [48], 4 class III studies [34,52–54] and two class IV studies [35,58] demonstrated significantly improved attitudes and/or acceptance of peers with a disability following a social contact intervention. Therefore, there is possible evidence (level C) to support the use of social contact

interventions to improve children's attitudes towards peers with a disability (see Table II). Social contact interventions were often based on social contact theory, which suggests that interaction between groups may change attitudes toward out-groups and may reduce stereotyping and prejudice. Interventions in this category varied in length from 6 weeks to 1 year. Three of the studies used a "Circle of Friends" approach [35,54,58] to enhance social inclusion in a mainstream setting. This works by mobilizing peers to provide support to a child with a disability. Others, such as Armstrong [48], used a "buddy system" where children with disabilities were paired up with a typically developing peer of the same gender and met regularly at school to engage in social activities. Newberry and Parish [52] had a similar principle behind their intervention; however, they focused on social interaction outside of the classroom. Further, Piercy's [53] study brought children with disabilities and typically developing children together through co-operative learning groups, which were more academic based than the other interventions. We were unable to compare the successful and unsuccessful components of social contact disability awareness interventions because all of these studies showed positive outcomes.

Simulation-based interventions

Four of the interventions included in our analysis used simulations to raise awareness about disabilities among children [24,30,43,59]. One class II study [30] and three class IV studies [24,43,59] showed improvements in children's knowledge about disability (refer to Table II). For example, Pivik's [30] simulation-based study engaged students in a 30-min virtual reality program to gain a better understanding of what it is like to move around in a wheelchair and the obstacles that are experienced. There is possible evidence (level C) to support the use of simulation interventions to improve children's knowledge about people with disabilities. Three class IV studies [24,43,59] showed improvements in attitudes towards children with disabilities; however, the data are inadequate to make a recommendation on the effectiveness of this type of intervention.

Curriculum-based interventions

Fourteen of the interventions included in our search were curriculum-based and focused on a wide range of disabilities including disability in general (6), mental illness (5), Tourette Syndrome, autism, cerebral palsy, and attention deficit hyperactivity disorder. There was a great range in the type of curriculum-based intervention including presentations [45], games [41], classroom exercises [4,32,33], videos [23,42,62], plays and puppet shows [20,27,63] and stories [1,9,61].

In regards to using curriculum-based interventions to improve knowledge about disabilities, one class II study [33], two class III studies [22,42] and three class IV studies [60,62,63] reported a significant change in knowledge about disability. This evidence is at a level C indicating that these interventions are possibly effective at improving knowledge about disabilities. Among the studies with a higher level of evidence, Rahman [33] used participatory educational

methods and awareness activities in the classroom to improve knowledge about mental health. Holtz's [42] intervention involved a video about children with a disability. Meanwhile, Trilvia's [22] intervention involved classroom-based activities that occurred 1 h/week over 10 weeks.

The findings from curriculum-based interventions regarding improving attitudes towards children with disabilities are mixed. For example, one class I study [32] found no significant change in attitudes towards disability following their intervention (refer to Table II). As we mentioned earlier this may have been due to both the intervention and control group having improved attitudes. Meanwhile, four class III [1,22,27,42,55] and three IV studies [20,61,62] also showed significant improvements in attitudes using curriculum-based interventions. These interventions included one-off presentations or class activities [20,42,55,61] to multiple sessions over a longer period of time [1,22,27]. As a result of the interventions showing conflicting results we are unable to make a recommendation of best practices using a curriculum-based intervention to influence attitudes towards children with disabilities.

Multi-media based curriculum interventions

Five of the interventions used multi-media curriculum based interventions to improve attitudes towards children with disabilities. This included two class II studies [49,50] and three class III studies [4,57,64]. The interventions ranged in length from one 45-min session (i.e. simulations and class activities) to eight 45-min sessions involving presentations, movies and class activities. The type of disability that interventions focused on also varied from disability in general for the younger grades to more specific conditions (i.e. mental health, visual impairments) for high school students. This evidence (level C) from these multi-media interventions indicates that these interventions are possibly effective at improving attitudes towards children with disabilities.

Only one multi-media based curriculum intervention [64] examined improvements in knowledge about disability, thus, the evidence is insufficient to make a recommendation about best practices.

Multi-component interventions

Twelve of the interventions included in our analysis used multiple components (i.e. several of the approaches mentioned above). Two class II studies [46,47], five class III studies [3,16,45,51,56] and four class IV studies [7,10,36,44] demonstrated an improved attitude towards peers following the intervention. Thus, these interventions (level C evidence) are possibly effective at improving attitudes towards children with disability. For example, three interventions used a combined approach involving curriculum activities and social contact with a person with a disability [10,28,36]. Two other studies similarly used multi-media curriculum activities combined with social contact [3,56]. Four interventions included a variety of curriculum activities, simulation exercises and social contact with a person with a disability [7,45–47]. Ison et al.'s [7] participants reported that using interactive activities along

with social contact (i.e. having a presenter with a disability) was the key to the success of their intervention. Children reported that social contact/exposure to someone with a disability is critical to improving behaviours [7,52,57]. Meanwhile Panagantiou [16] and Xafpoulous [44] used curriculum activities and simulation exercises to influence children's attitudes through a range of Paralympics activities. The programs varied in length from a one-day session of Paralympic activities [16] to four 90-min sessions over 2 weeks [46] to a 6-day program involving multi-media curriculum activities and simulation exercises [51].

One of the advantages of a multiple components intervention was that several authors compared the effectiveness of different components within their intervention. For example, Krahe [45] found that social contact was essential to improving attitudes towards people with disabilities. They also reported that a combined cognitive-behavioural intervention had a statistically significant effect in improving attitudes towards people with disabilities than cognitive intervention. Meanwhile, Favazza [10] found that those exposed to the whole intervention as opposed to individual components had both short and long-term gains in terms of social acceptance of peers with disabilities. They found that statistically significant gains in acceptance were made in the group that had a high level of contact with peers with a disability. In contrast, Florian and Kehat [47] found that social contact did not influence attitudes.

Rosenbaum's [28] study had mixed findings where they compared different interventions for improving attitudes. One involved a buddy program lasting 3 months, one involved a series of 4 (45 min puppet shows) over 10 weeks and the final intervention combined the puppet show and the buddy program concurrently. They found that the children in the intervention that combined the puppet show and buddy program did not have improved attitudes compared to the children in the buddy-only group. They suggest that this may have been a result of the dissonance between what children experienced and what they were led to expect in the educational puppet program [28].

In sum, there were five key types of interventions based on their mode of delivery (i.e. social contact; simulation; curriculum; multi-media curriculum, and multiple components) which influenced knowledge of disability, attitudes and acceptance of peers with disabilities.

Length of the interventions

The length of the disability awareness interventions varied greatly from a one-off 20-min session to a 1-year program with bi-weekly activities lasting 30–90 min each session. With a few exceptions, most studies that had positive outcomes involved more than one session and had multiple components such as books, videos, discussions, simulations, practical exercises, and/or interaction with people with disabilities. Some researchers also recommended that several approaches and methods be used for disability awareness interventions [47].

Only two studies examined the impact of different lengths/types of programs on the attitudes toward children with disabilities. Reina et al. [51] found that their 6-day intervention was more effective than the 1-day awareness unit. In Rillota and Nettlebeck's [3] study, students who completed an 8-session awareness program reported more positive attitudes toward children with a disability compared to those who attended the 3-session awareness program. Meanwhile, Florian [47] found no difference between a 6-week and 9-week program in altering attitudes in a multi-component intervention. Pitre [27] argued that a one-off session is unlikely to have a long-lasting impact on attitudes and behaviour. This suggests that there may be a threshold when the program can maintain its impact. The first two studies compared shorter duration (6-day versus 1-day; and 8 weeks versus 3 weeks) while the study that found no difference in outcomes was 6 versus 9 weeks (considerably longer than the comparisons in the first two studies). The discrepancy in findings by length of programs could also have been due to the heterogeneous culturally and socio-economically diverse sample.

Discussion

This review provides evidence for how to achieve optimal outcomes for improving attitudes towards and acceptance of people with a disability. Uncovering the effective components of disability awareness interventions is especially important as schools, educators and health professionals increasingly invest in the development of disability awareness interventions to further enhance social inclusion [38]. Although some interventions in this review have more recently implemented inclusive education policies compared to others, the authors of these interventions consistently argue that there are difficulties with achieving social inclusion of children with disabilities and that this cannot be achieved through inclusive polices alone [20].

Our review shows that several different types of disability awareness interventions can be used to positively influence knowledge about people with disability. Common elements of successful interventions included breaking down stereotypes and creating awareness of the barriers that with people with disabilities encounter. Such interventions were done in a variety of different formats including simulations, multi-media and curriculum-based interventions which varied greatly in length and target audience.

Our findings also highlight that several successful strategies can be used to influence attitudes towards children with disabilities. Common components of successful interventions included social contact with a person with a disability over a period of time, multi-media and multi-component approaches involving stories, class activities and discussions. The social contact approach was used more often with younger children over longer periods of time from 6 weeks to 1-year programs to allow time to develop understanding of disability and possible friendships. A few of the other types of interventions were one-off sessions while many others ran over a longer period of time.

Improving knowledge about disability is important because children's attitudes are often strongly influenced by their degree

of knowledge [7,65]. A lack of understanding can perpetuate stigma and social exclusion [2,60]. Indeed, unfavourable peer attitudes are a major barrier to the full social inclusion of children with disabilities in integrated schools [32].

Many of the disability awareness interventions we reviewed reported a consistent gender and age-based pattern influencing attitudes whereby females often had more positive attitudes towards peers with disabilities than males. Past evidence also shows that girls often have more favourable attitudes towards children with a disability compared to boys [1] and that some interventions may appeal differently to boys and girls [38]. Similarly, an age based pattern emerged where children from older grades were more accepting than younger children. This is consistent with similar research on bullying interventions suggesting that younger children may benefit less than older children [8]. Our review also highlighted that interventions used most often with younger children focused on disability in general while some successful interventions with older students were more disability specific.

Our recommendations for the further development of disability awareness programs include having multiple components, interactive activities, social contact with people who have a disability, several sessions over a longer period of time rather than a brief one-off session and having standardized measures and a rigorous methodological design. Interventions should also be context specific taking educational policies and societal customs into account.

What is lacking in the disability awareness interventions we reviewed is that they tended to target one class at a time. It would be worthwhile to explore a whole-school based intervention, which has been shown to be effective in the bullying literature [8]. An intervention that is only based on one level (e.g. classroom) may not have a lasting impact. Failing to address the systemic issues and the social environment related to social exclusion can undermine the success of the intervention [8]. Thus, a multi-level and multi-component approach is needed involving school boards, community, teachers, parents and children to improve attitudes towards people with disabilities.

An important element for future programs to consider is the influence of the socio-contextual environment of how children with disabilities are perceived and treated [2]. This is particularly critical when choosing an intervention that it is not only age appropriate but also that it is culturally sensitive as well in recognizing different views of disability. Consistent evidence shows that attitudes towards people with disability vary by cultural context [66]. The studies examined in our review were from a wide range of countries where views of disability may vary considerably.

Conclusion

Our review focused on disability awareness interventions for school aged children. This study addressed several gaps in the literature by synthesizing the common components of effective disability awareness interventions. Developing a better understanding of the effective components is critical to help

improve the social inclusion of children with disabilities [38]. A focus on children is important because their attitudes are still evolving and early interventions can be especially beneficial. Successful interventions can provide children with opportunities to develop positive attitudes about differences in respectful contexts [38].

Overall, the studies reviewed suggest that there is possible evidence that disability awareness interventions are effective at influencing knowledge about and attitudes toward people with disabilities. Commonalities of successful interventions included having multiple components over a period of time and often included social contact with a person who has a disability.

Several limitations to this review need to be considered. First, some studies had heterogeneous samples and relatively small sample sizes. Second, the use of variable outcome measures may limit the ability to accurately measure the effects of the interventions. Finally, the studies were conducted over a broad range spanning over 30 years and across different cultures. Thus, attitudes towards people with disabilities may differ across time and context [66].

There are several directions for future research. First, more rigorous designs are needed (e.g. RCTs) to evaluate the effectiveness of interventions on attitudes towards children with disabilities and over longer periods of time to assess any changes. Second, more research is needed to explore comparisons of different lengths, formats and types of schools (e.g. public, private), setting (e.g. class versus whole-school based) and geographic locations. Specifically, comparisons of effective components within interventions should be evaluated individually to examine what works best for whom and in what context. Third, further work should explore who benefits most from the interventions by paying close attention to the socio-demographic characteristics of the sample (i.e. gender, social class, ethno-cultural status, geographic location). Fourth, more exploration is needed around simulation and curriculum-based interventions which showed mixed results in our review. Further, despite the wide variety of approaches used to enhance disability awareness, we did not find any studies meeting our inclusion criteria that used a computer game. Further research could explore this as a mechanism of influencing attitudes towards people with disabilities. Finally, very little is known about the impact of these interventions on children with disabilities (e.g. their perceptions of how peers are treating them) and how interventions make them feel. It would also be worthwhile to seek their involvement in the future development of disability awareness interventions.

Implications for Rehabilitation

This review can help rehabilitation professionals, educators and policy makers to better understand what types of interventions work best for school age children to enable more youth with disabilities to feel socially included at school. First, rehabilitation health care providers should help children with disabilities to be knowledgeable about their condition and how and when it is best to disclose to their peers. This can help

to facilitate knowledge about their specific needs at school. Clinicians and educators should be aware of the challenges that children with disabilities face such as social exclusion at school and be prepared to provide children with resources and interventions on how to cope. Second, clinicians, educators and children with disabilities should both contribute to the development of age appropriate disability awareness interventions. Very few of the interventions were developed or implemented by clinicians knowledgeable about pediatric disability. Involving such professionals at the outset of developing a program may enhance disability awareness interventions. Researchers, clinicians and educators need to work together to further develop and test interventions that can facilitate disability awareness among school-age children to reduce some of the negative consequences children such as social exclusion. Third, educators should choose an appropriate intervention to meet the needs of the children in their classroom (i.e. age, disability type, cultural background) while also considering the broader societal influences on attitudes towards disability. Finally, at a community level, disability advocacy should target schools, teachers and increased government funding for disability awareness programs for school-age children.

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