

## **Attitudes towards people with disabilities: a systematic review of intervention effectiveness**

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### **Abstract**

The improvement of attitudes towards people with disabilities has led to studies focusing on the impact of interventions. This review systematically analyzes and synthesizes the use of interventions to influence attitudes toward people with disabilities. A comprehensive search was conducted across multiple databases to identify studies that used an intervention in English with a defined assessment instrument meant to measure attitudinal changes toward people with disabilities. Based on a literature research, 32 studies conducted in fourteen different countries were included. In the majority of the cases, the use of interventions was an effective tool to improve attitudes towards disabilities. Implications of findings for practitioners and researchers are discussed.

**Keywords:** Rehabilitation counseling, interventions, attitudes, disability, stigma, society.

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### **Introduction**

People with disabilities often experience negative attitudes and discriminatory actions in society (Smart, 2009). Being a target of negative attitudes and behaviors can lead to feelings of loneliness, anxiety, and low self-worth (Marini & Stebnicki, 2017). Additionally, prejudice, attitudinal barriers, and discrimination can limit the opportunities of people with disabilities in multiple areas including education (Rao, 2004), employment (Gilbride, Stensrud, Ehlers, Evans, & Peterson, 2000; Taylor, Krane, & Orkis, 2010), community integration (Verdonschot, de Witte, Reichrath, Buntinx, & Curfs, 2009) and access to services (Krahn, Walker, & Correa de Araujo, 2015). Therefore, rehabilitation professionals can assess negative attitudes and their impact on the experiences and integration of people with disabilities.

Negative perceptions toward disabilities, in general, can affect behaviors and attitudes towards people with disabilities at social and individual levels. Societal perceptions of disabilities can also lead to stigma that can affect equality and inclusion (Green, Davis, Karshmer, Marsh, & Straight, 2005). Moreover, the societal stigmatization of disabilities can create substantial disparities in health, housing, employment, limited community life, and increased social distance (Werner, Corrigan, Ditchman, & Sokol, 2012). Exposure to society's disability stigma can also result in self-stigma when a person with a disability internalizes a sense of prejudice and discrimination (Corrigan & Kosyluk, 2014). As a result of self-stigma, people with disabilities may experience reduced self-esteem, empowerment, and hope, as well as show reluctance to participate in treatment, employment, and services (Livingston & Boyd, 2010). Consequently, disability stigma can result in social disadvantages rooted in society as well as in the individual.

These social and individual drawbacks, as a result of stigma, can vary for a variety of factors. The level of stigma varies depending on types of impairment, reason of disability onset, and severity of the condition. In a previous study, perceptions of parents and teachers on raising a child with disability, considering stigma and marginality, described two views of disability (Lalvani, 2015). Parents, using a social model, recognized cultural meanings ascribed to disability related to stigma, marginalization and access while teachers utilized a medical model to biologically define the experience of children with disability. In addition to perspective on disability from different models, stigma is on a spectrum that fluctuates depending on type of impairment. For instance, people with intellectual disabilities and mental illness tend to experience the most social inequalities and disparities in basic human rights due to stigma (Ditchman, Werner, Kosyluk, Corrigan, 2013). People with intellectual disabilities, severe mental health conditions, sensory disabilities, and albinism tend to experience more stigma than people with physical disabilities (Rohwerder, 2018).

In order to reduce the undesirable impact of negative attitudes on the quality of life of people with disabilities, a variety of social interventions have been implemented and tested to increase education and improve attitudes. For instance, educational projects that enhanced knowledge about disabilities (Kim, Park & Snell, 2005; Tavares, 2011) as well as previous exposure to disability related information (Vignes et al., 2009) had been found to have a positive effect on students' attitudes regarding disabilities. Generally, education and contact interventions have been found to be the most effective approaches to change attitudes toward disabilities (Corrigan, Morris, Michaels, Rafacz, & Rusch, 2012). Similarly, interventions used in different settings have been effective to diminish the impact of stigma on the perception of disabilities in society (Dunn, 2015).

#### **Interventions influence on changing attitudes**

People with disability face significant social challenges impacting their full participation and inclusion in society. Ableism relations, which are based on an ideal of normal and a division between "normal" human and subhuman, result in marginality and a perception of disability as problematic to community systems (Campbell, 2012). These negative interpretations of disability represent a complex barrier that creates oppression for people with disability resulting in ableism (Brown & Broido, 2014). Moreover, ableist attitudes are multipart and may sometimes change slowly with a type of intervention.

Attitudes are considered to have three components, affect, cognition, and behavior, which may function as antecedents and consequences of attitudes (Olson, 1993). In other words, the three components can form attitudes but attitudes can also impact affect, cognitions, and behaviors. Additionally, attitudes impact the framework use to interpret environments and interactions with people with disabilities with a structured set of cognitions, relationships among those cognitions, and specific examples based on previous experiences (Fichten, 1994). Hence, attitudes can play a role in evaluating, interacting, and supporting people with disabilities.

Since changing attitudes can influence future behaviors, interventions represent an opportunity to increase positive attitudes towards people with disabilities. Attitudes can predict one's future behavior after a direct experience and information about the attitude object (Azjen, 2005). Disabilities become an attitude object that can influence one's behaviors and decisions. When individuals have negative attitudes towards disabilities, people with disabilities have limited opportunities of acceptance and educational engagement (Moore & Nettelbeck, 2013). However, different interventions strategies have positively influence attitudes towards individuals with disabilities (Rabenschlag et al., 2012; Swaim & Morgan, 2001) representing mechanism to foster accepting behaviors. Because of the predicting ability of behaviors, interventions focus on changing attitudes can change interactions and inclusion for people with disability.

Attitudinal interventions targeting disabilities have been utilized for many years to boost the quality of life of people with disabilities. In a systematic review, direct contact and indirect contact with people with disabilities were found as effective mechanisms to improve children's attitudes towards disability (MacMillan, Tarrant, Abraham, & Morris, 2014). Similarly, education based interventions have also positive effects on attitudes towards disabilities using brief educational media (e.g. Lindau, Amin, Zambon, & Scior, 2018), three weeks education projects (e.g. de Boer, Pijil, Minnaert, & Post, 2014), and combined methods (e.g. Reina, Lopez, Jimenez, Garcia-Calvo, & Hutzler, 2011). Equally, creative teaching interventions in a meta-analysis, as puppet shows, have led to changes in individuals' attitudes and knowledge of individual with disabilities (Dunst, 2014).

Since interventions can help reduce the influence of stigma on the lives of people with disabilities, a systematic review of methods utilized to improve attitudes can assess effectiveness and provide potential options. Despite the research on interventions to improve attitudes toward disability has focused on strategies, the common elements of effective components can be synthesized. The aim of this review was to systematically review and synthesize the use of attitudinal interventions and how attitudes were changed toward people with disabilities using different strategies. This review intends to assist rehabilitation services professionals in identifying and understanding the implications of interventions in the inclusion and participation of people with disabilities. Understanding the significance of interventions is beneficial to intentionally incorporate strategies in services and social environments as well as increase disability intervention awareness. At the time of this study, other systematic reviews focused exclusively on children or focused on different parts of attitude changes; thus, this review specifically explored the utilization and success of different interventions to enhance attitudes toward disabilities.

## Method

The approach used for this systematic review was an adapted version of a suggestion by Bettany-Slatnikov (2010a, 2010b), who recommends starting with an overall research question and then investigating populations, interventions, comparison of interventions, and outcomes. In this study, the overall research question is “how effective are interventions on changing attitudes toward people with disabilities?” The following supplemental research questions were also considered:

RQ1: Whose attitudes were attempted to be changed, and toward what types of disabilities?

RQ2: What interventions were used in attempting to change attitudes?

RQ3: What were the results of the interventions?

### Criteria for inclusion

Studies included in this review evaluated interventions to change attitudes toward disabilities. For the purpose of this analysis, dissertations, literature reviews, conference papers, and book reviews were not included. Even though different interventions could help to improve attitudes, the focus was to evaluate studies performed using the English language with a clear measurement directed toward any type of disability. For consideration in this analysis, empirical studies published in peer-reviewed journals also had to involve participants in an intervention, measure attitudes toward disability, and take place in a community or educational setting.

### Identification process

A systematic search was conducted using online library databases and the search engines of Academic Search complete, Psychology and Behavioral Sciences Collection, PsychINFO and PsycARTICLES to find relevant peer-reviewed academic journal articles using the general search terms: attitude change, intervention, and disabilities. The systematic review of intervention studies focused on research published between 2005 and 2016. After eliminating any irrelevant or duplicate results, a total of 379 unique articles were generated. These peer-reviewed articles were then revised for the following inclusion criteria: 1) included an attitude change intervention, 2) able-bodied participants were the participants in the intervention, 3) the utilization of a qualitative and/or quantitative type of disability attitudes measurement 4) the study took place in a community or educational setting, and 5) written in English. Articles were excluded if they were about the psychometric properties of an instrument, were a meta-analysis, did not deal with specific attitudes about people with disabilities (i.e., attitudes about sex, diversity, inclusion, etc.), took place in a medical setting, or were about another unrelated topic. The end result was the total of 35 articles used in this analysis.

## Results

### Overview of studies

The full data set containing the results from all 35 studies can be found in table 1. The studies identified in this analysis took place all over the world. The sample sizes ranged from 2 to 873, and the age of the participants started from 7-years old into late adulthood. Specific answers to the research questions will be discussed in the next sections.

### Intervention population samples and disability types

To answer the question of whose attitudes were attempted to be changed, we first categorized the studies by country. The United States had the most studies conducted in it, with 11 (31.43%) while twelve (34.29%) of the remaining studies were conducted in various countries in Europe, five (14.29%) were conducted in the Middle East, three (8.57%) were conducted in Canada, and two (5.71%) were conducted in Africa, and remaining two (5.71%) were conducted in India, and Australia.

Subsequently, we also divided the groups within the studies based on whose attitude was attempted to be changed. Overall, there were 41 different groups tested but some studies intervened with more than one type of group, thus there are more groups than studies. The most frequent intervention group was college students, with 20 (48.78%). Eight (19.51%) of the remaining groups were students in school, four (9.76%) were various types of professionals already working with people with disabilities, another four (9.76%) with the general public two (4.88%) were with teachers, and three others (7.32%) were mothers of children with intellectual disabilities, theme park employees, and wheelchair users due to a spinal cord injury.

To answer the question what disabilities were the object of attitude change, we grouped the specific disabilities listed in the studies into six broad disability categories. Because some studies measured the attitudes toward multiple types of disabilities, there were a total of 48 disabilities noted in the studies. The most frequently studied disability attitude was intellectual disabilities that included learning disabilities, with 15 (31.25%), nine (18.75%) were the disability population as a whole, eleven (22.92%) were physical disabilities such as spinal cord injury, cerebral palsy, spina bifida, and muscular dystrophy, six (12.5%) were on sensory disabilities such as vision and hearing impairments, another five (10.42%) were mental disability such as mental illness and autism, and the remaining two (4.17%) were Tourette's syndrome and communication disorders. The specific context of the results regarding used interventions for attitudinal change toward disabilities will be discussed in the next section.

### **Interventions for attitudinal change**

To answer the question of what types of interventions were used to change attitudes, we organized the data first by category and then by study. We grouped the interventions into categories based on type of interventions. The interventions varied from formal education, contact, simulations, combined instruction, and community based approaches.

#### **Type of interventions.**

We next looked at the intervention data across studies. Of the 35 studies, 13 (37.14%) combined instruction, which included any planned combination of formal instruction with contact or simulation, nine (25.71%) used only formal education, seven (20%) used only contact, two (5.71%) focused on simulations, and one study each used teacher support, marketing, counseling, or a film festival (11.43%). Each group of interventions aimed to change attitudes toward disabilities.

#### **Combined instruction.**

Thirteen studies combined formal instruction and a behavioral component. These studies aimed to blend a cognitive intervention, which prepare participants by learning about medical conditions and personal experiences prior to engaging in a behavioral activity (contact or simulation).

For instance, teachers in Cairo participated in 12 sessions (60 minutes each), combined with working and providing training to people with intellectual disabilities in sheltered workshops (Hassanein, 2015). In another study, medical students, in London, participated in a 14-week neurosciences course which included a three hour lecture on intellectual disabilities and an opportunity to participate in a three-week placement at two learning disabilities services (Sinai et al., 2013).

Using contact theory as a theoretical framework, Wozencroft, Pate and Griffiths (2015) examined the impact of a service learning class on college students' attitudes toward people with disabilities. As part of this class, students received lecture material and worked directly with people with disabilities in a week long therapeutic camp environment. In another study involving graduate and undergraduate students, a course curriculum along online learning component, lectures, team based problem solving, and client interviews, were used to change knowledge, skills, and attitudes toward individuals with intellectual disabilities (ID) among healthcare students in Canada (Jones et al., 2015). To close the training, students participated in an interactive learning group to formulate a comprehensive assessment and treatment plan from the clinical vignettes.

Five studies involved undergraduate students in different universities across the world. In a study in Ireland, undergraduate dental students enrolled in a comprehensive, blended learning program involving lectures, experiential workshops (i.e. observing dental procedures), and access to informational resources (Phadraig et al., 2015). In another study, undergraduate students received several preparatory lectures and seminars before interacting two to three times with a person with mild to moderate learning disabilities in a local day center or social enterprise unit (Smith & Forrester-Jones, 2014). Fourth year undergraduate medical students participated in a three hour communication skills training session to improve interactions and reduce communication issues with patients with intellectual disabilities (Tracy & Iacono, 2008). Finally, Israeli undergraduate social work students participated in a service learning program called Ripple Effect that included weekly interactions with people with disabilities (Zychlinski et al., 2016).

To change negative attitudes toward people with physical disability, ninth grade students in Germany participated in a cognitive intervention, which provided information and stereotypes about physical disability, and a behavioral intervention of engaging in three Paralympic disciplines under the instruction of athletes with disabilities (Krahe & Altwasser, 2006). In Israel, middle school students without disabilities, who attended general education schools, participated in an inclusion program requiring 30-90 minute weekly or bi-weekly activities with students in special education classes (Marom et al., 2007). Students without disabilities received information about the specific disabilities prior interacting with students with disabilities in joint activities such as, sports, music, arts, volunteering, and social games. In another Israeli study, 9th grade students from various junior high schools participated in a school year long leadership integration program which combined information about disabilities with opportunities for contact with individuals with disabilities (Cohen et al., 2012). After four months in the program, the 9th grade students held workshops about prejudice, stigma, equal opportunities, and experiences with disabilities for the 8th grade students.

One study combined an educational component with a behavioral activity using simulation. Lewis (2011) used lecture-based awareness training and active impairment simulation activities to evaluate their influence on the attitudes of urban planning students in a Canadian university. The training event consisted of three lectures followed by a simulation exercise where the students wore prosthetic devices (e.g. leg braces), used mobility equipment (e.g. wheelchairs, crutches), or wore goggles. The lectures addressed general topics related to disability and impairment, and accessible planning and design. Another study used six digital brief interventions consisting of different combinations of education, indirect and imagine contact (Lindau, Amin, Zambon, & Scior, 2017).

### **Formal instruction**

Nine studies used a form of training to improve participants' attitudes toward disabilities. Two studies offered a workshop lasting from 90 minutes to one day. Tourism students in Slovenia participated in a 90 minute training covering material about social and psychological dimensions of disabilities as well as financial opportunities for businesses to generate profit in the growing market of customizing tourism for people with disabilities (Bizjak et al., 2011). In another study, a one-day disability awareness workshop was used to improve knowledge and attitudes toward guests with disabilities in theme parks (Hall, 2008). The workshop offered two sessions: one covering general issues about disability followed by a second session about specific disability areas, including origin of attitudes, strategies, double disability, among others.

As opposed to offering brief interventions, two studies opted for long educational engagements in academic settings. In Jordan, nursing students attended a course on mental health and pathology to improve attitudes toward people with mental illness (Hamaideh & Mudalla, 2009). Finally, rehabilitation students, with different professional backgrounds and nationalities, completed a semester long program with seminars and lectures to establish a positive attitude toward disability and working with people with disability (Yazdani et al., 2016).

Another type of formal instruction used in five studies was the use of short videos about people with disabilities. In Ireland, school aged children were exposed to audiovisual material promoting inclusion for children with Down syndrome (Gannon & McGilloway, 2009) while in the UK students watched a video on Paralympic athletes (Ferrara et al., 2015). Also in the UK, college students watched either a video of a rock band that included people with and without disabilities or a video about a hate crime committed against a person with an intellectual disability (Walker & Scior, 2013). The other two studies were carried out in the United States. Flatt-Flutz and Phillips (2012) utilized a training video on empowerment of

individual with intellectual and developmental disability for direct support professionals in human services. Lastly, Holtz and Tessman (2007) used short videos to increase elementary children's knowledge and improve attitude toward a peer with Tourette syndrome.

### Contact

Seven studies used direct or indirect contact between participants and people with disabilities as an intervention to positively influence attitudes toward disabilities. In order to create an intervention that included equal-status contact and pursuit of common goals, Sullivan and Glidden (2014) required college swim team members to work together with Special Olympics swimmers to pursue swimming-related goals in 4 sessions over a 6-week period. In Canada, volunteering for 4 to 10 months with children with physical or hearing impairments was used to decrease social distance and improve attitudes (Fichten et al., 2005).

In another study, personal narratives, which can teach and influence emotions, written by individuals with complex communication needs, were used to change the attitudes of undergraduate business majors (McCarthy et al., 2010). Similarly, Galli et al. (2015) explored the influence of direct and indirect contact on attitudes toward wheelchair users. Participants were asked to interact with an individual with spinal cord injury in a 45-minute semi-structured conversation or to listen to a 45-minute audio about the experiences of wheelchair users. Equally, community based groups listened to adults with disabilities sharing their personal narratives (Gona, Newton, Hartley, & Bunning, 2018).

Finally, a study in the United States used person-centered videos describing the life experiences of people with visible disabilities (Lu, Webber, Romero, & Chirino, 2018). Staff, who provided services for adults with intellectual disabilities, participated in a half day training delivered by a trained professional and a person with an intellectual disability (ID) (Hutchinson et al., 2014). The Who's Challenging Who program incorporated two levels of contact with people with behavior challenges: direct contact with trainer with ID (valued position) and workshop material focused on people with ID and/or autism.

### Simulation

Having participants act out being disabled for a period of time is considered simulation. In order to foster the development of positive attitudes toward persons with physical disability, Amosun, Wolmink and Rosin (2005) followed two South African students who registered in a 4-week special training module as part of their medical training. A role-playing exercise was used as a single, active learning intervention requiring to assume a mobility limitation and use a wheelchair for five consecutive working days. Students also maintained a journal to capture their everyday reflections about their simulation experience. Undergraduate student in an American university participated in a three-phase mixed method design involving simulation activities during an abroad study experience (McKenney, 2018).

### Sole interventions

Four studies involved provided an intervention that required participants to engage in a variety of activities or aimed to affect society at large. In a study, Teachers in Science, Technology, Engineering Math (STEM) classes participated in a program educating students with visual impairments to increase awareness and provide funding for supplemental adaptive resources (Rule et al., 2011). In another study, Kirkwood and Stamm (2006) guided the design, distribution, and evaluation of an anti-stigma campaign regarding people with mental illness. A film festival was designed to provide authentic representation of people with disabilities living normal lives to help viewers see individuals with disabilities as people first (Schwartz et al., 2010). Lastly, counseling sessions were used to change attitudes of mothers of children with disabilities (Saravanan & Rangaswamy, 2012). Next, outcomes of the interventions will be discussed.

### Intervention outcomes

Some studies aimed to evaluate the utilization of interactive instruction type of interventions to improve attitudes toward people with disabilities. Wozencroft, Pate and Griffiths (2015) reported that students' attitudes positively changed after taking a course and remained constant after interacting with someone with a disability. The attitudes of students from different majors also positively changed when using interaction and education (Bizjak et al., 2010; Lewis, 2011; McCarthy et al., 2010; Smith & Forrester-Jones, 2014; Sullivan & Glidden, 2014; Yazdani et al., 2016).

Five studies tried to evaluate the outcomes of work training interventions that positively influenced attitudes (Flatt-Fultz & Phillips, 2012; Hall, 2008; Hutchinson et al., 2014; Hassanein, 2015; Rule et al., 2011). Communication training, simulation activities, and participation in a course helped improve attitudes toward disabilities among future medical professionals (Amosun et al., 2005; Hamaideh &

Mudallal, 2009; Jones et al., 2015; Tracy & Iacono, 2008). Furthermore, a brief film-based digital intervention, showed to community based participants, had a small positive effects on attitudes to people with disabilities improved (Lindau et al., 2017). Likewise, videos with real-life experiences of people with visible disabilities positively influenced attitudes of undergraduate students (Lu et al., 2018).

In a couple of studies, involving adults (Fichten et al., 2005), volunteer contact as well as direct interaction with a wheelchair user, were effective in enhancing attitudes (Galli et al., 2015). Similarly, direct contact between middle school Israeli students without disabilities with those with disabilities helped to changed stereotypes (Cohen et al., 2012; Marom et al., 2007) as well as personal narratives improved recognition of the person and generated ideas for collective action in favor of disabilities (Gona et al., 2018). In another study, 9th grade students' attitudes positively changed as a result of leadership inclusion training and personal contact with people with disabilities (Cohen et al., 2012). Additionally, the use of visual media also led to positive changes among children and adults in small and large audiences (Holtz & Tesson, 2007; Kirkwood & Stamm, 2006; Schwartz et al., 2010).

In this review, four studies were identified as reporting no effect on attitudinal changes after implementing an intervention method with participants. In a study on school aged children, Gannon and McGilloway reported that girls tended to hold more favorable attitudes than boys toward children with learning disabilities (2009). Compared to other studies, they found that having a friend or relative with Down syndrome or watching an informative video about children with Down syndrome made no differences in attitudes toward disabilities among participants. Moreover, Phadraig et al. (2015) reported that dental students reported no difference in attitudes toward disabilities before or after participating in a brief blended learning program involving lectures, experiential workshops and access to resources. Sinai, Strydom and Hassiotis (2013) also reported that medical students had a better understanding of the definition of intellectual disability but there was no significant change in attitude after enrolling in the neurosciences course. Finally, participation in a service learning program was unsuccessful to lead to significant changes in attitude (Zychlinski et al., 2016). However, volunteering was correlated with negative attitudes toward disability while positive attitudes were significantly associated with prior positive attitudes among Israeli students.

**Table 1.** Studies using interventions to change attitudes toward people with disabilities

Study	Intervention Group	Type of Intervention	Type of Disability	Results
Amosun, S. L., Volmink, L., & Rosin, R. (2005)	2 university medical students in South Africa (College)	Five days of disability simulation (Simulation)	Physical disability – wheelchair user(Physical)	The two students reported improved attitudes
Bizjak, B. Knezevic, M., & Cvetreznik, S. (2010)	124 tourism students in Slovenia (College)	Two disability education (Formal Instruction)	Disability in general (General)	Both forms of education led to improved attitudes
Cohen, R., Roth, D., York, A., & Neikrug, S. (2012)	164 9 <sup>th</sup> grade students, leadership program in Israel (Pre-college)	Compared education and contact in a school year (Combined Instruction)	Intellectual disabilities(Intellectual)	Significant improvement in attitudes among students
Ferrara, K., Burns, J., & Mills, H. (2015)	114 college students in the UK (College)	Video of Paralympic and Olympic performances (Formal Instruction)	Intellectual disabilities (Intellectual)	Both groups had improved attitudes, and Paralympic media had the greater improvement
Fichten, C. S., Schipper, F., & Cutler, N. (2005)	71 new adult volunteers in Canada (Volunteers)	Working with children (4- to 10- month) (Contact)	Children with physical or hearing impairments (HI)(Physical, Sensory)	Attitudes toward both groups of children improved with better attitudes toward HI
Flatt-Fultz, E. & Phillips, L. (2012)	43 direct support professionals in the US (Professionals)	Empowerment video (Formal Instruction)	Intellectual and developmental disabilities (Intellectual, General)	More empowering attitudes after watching training video
Galli, G., Lenggenhager, B., Scivoletto, G., Molinar, M., & Pazzaglia, M. (2015).	85 wheelchairs users, physical therapists, people w/o disabilities in Italy (Professionals, Public, Other)	Interaction with wheelchair user and audio recording (Contact)	Wheelchairs use due to a spinal cord injury(Physical)	Having direct contact increased positive attitudes
Gannon, S. & McGilloway, S. (2009)	118 8-11 year old children in Ireland (Pre-college)	Lecture with supporting media (Formal Instruction)	Children with Down syndrome(Intellectual)	No significant improvement in attitudes

Gona, J., Newton, C., Hartley, S., & Bunning, K. (2018).	249 community members Sub-Saharan Africa.	Personal narratives (Contact)	Diverse disabilities	Improved recognition of PWD as fellow human beings.
Hall, E.(2008)	40 theme park employees in the US (Other)	A 1-day disability awareness workshop (Formal Instruction)	Diverse type of disability. (General)	Disability awareness workshop enhance knowledge and positive attitudes toward guests with disabilities
Hamaideh, S. H. & Mudallal, R. (2009)	193 nursing students in Jordan (College)	Mental health & pathology course (Formal Instruction)	Mental illness(Mental)	Attitudes improved four of the five subscales
Hassanein, E. E. A. (2015)	18 teachers in Egypt (Teachers)	education and contact intervention (Combined Instruction)	Intellectual disabilities(Intellectual)	Participation in educational and contact intervention improved attitudes
Holtz, K. & Tessman, G. (2007)	179 elementary school children US (Pre-college)	Video-based intervention (Formal Instruction)	Tourette Syndrome(Other)	Video enhanced knowledge, positive attitudes, and behavioral intentions
Hutchinson, L. M., Hastings, R. P., Hunt, P. H., Bowler, C. L., Banks, M. E., & Totsika, V. (2012)	76 staff members at disability service related agencies in the UK (Professionals)	Trained by a person with an intellectual disability (Contact)	Intellectual disabilities and/or autism(Intellectual, Mental)	Significant improvement in 3 of the 4 subscales (empowerment, self-efficacy, and empathy)
Jones, J., McQueen, M., Lowe, S., Minnes, P., & Rishke, A. (2015)	247 graduate students in Canada (College)	Training curriculum and interview (Combined Instruction)	Intellectual disabilities (Intellectual)	No significant change in attitudes
Kirkwood, A. & Stamm, B. H. (2006).	341 community caregivers, gatekeepers, and teens in the US (Professionals, public)	Anti-stigma social media marketing campaign (Other)	Mental illness and the general disability population(Mental, General)	One year follow-up showed changes in attitudes and/or behaviors

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Krahe, B. & Altwasser, C. (2006)	70 9 <sup>th</sup> grade students in Germany (Pre-college)	Training materials plus interaction (Combined Instruction)	Physical disabilities(Physical)	Only the cognitive-behavioral (contact) intervention produced signification positive results
Lewis, J. L. (2011).	200 students in Canada (College)	Education & simulation (Combined Instruction)	Physical & visual (Physical, Sensory)	Interventions improved attitudes, educational intervention better
Lindau, N., Amin, T., Zambon, A., & Scior, K. (2017).	401 adults UK residents	Education with contact (Combined Instruction)	Intellectual Disability(ID)	Small positive effects on attitudes.
Lu, J., Webber, W., Romero, D., & Chirino, C. (2018)	53 US undergraduate students	Person-centered videos (contact)	Diverse disabilities	Improved explicit attitudes
Marom, M., Cohen, D., & Naon, D. (2007)	170 10 to 12-year old children in Israel (Pre-college)	Year-long information plus contact (Combined Instruction)	ID/Cerebral palsy(Intellectual, Physical)	Only the intervention group had improved attitudes
McCarthy, J., Donofrio-Horwitz, L., & Smucker, L. (2010).	109 business major students in the US (College)	Reading personal narratives (Contact)	Communication disorders(Other)	Reading narratives improved attitudes
Mckenney, A. (2018).	10 US participants (College)	(Simulation) activity	Physical & blindness(Physical/Sensory)	positively affect people's attitudes and levels of empathy
Phadraig, C. M. G., Nunn, J. H., Tornsey, O., & Timms, M. (2014)	109 undergraduate dental students in Ireland (College)	Education and experiential activities (Combined Instruction)	The general disability population(General)	No improvement in attitudes
Rule, A., Stefanich, G., Boody, R., & Peiffer, B. (2011)	15 science and mathematics teachers in the US (Teachers)	Teacher support: adaptive equipment and consultation (Other)	Visual impairments(Sensory)	Positive changes in attitudes among teachers in STEM classes.
Saravanan and Rangaswamy (2012).	32 mothers of children with disabilities in India	Psychological counseling (Other)	Intellectual Disabilities(Intellectual)	Mother's attitudes became more positive towards their children with

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	(Other)			intellectual disability
Schwartz et al., (2010)	107 graduate students, faculty, and community members in the US (College)	Film festival (Other)	Cerebral palsy, autism, Fragile X, Down syndrome & developmental disabilities(General)	Film can help to foster positive attitudes towards people with disabilities
Sinai, A., Strydom, A., & Hassiotis, A. (2013).	133 medical students in the UK (College)	14-week neurosciences course plus clinical placement (Combined Instruction)	Intellectual and learning disabilities (Intellectual)	Medical students increased knowledge of definitions and favorable attitude towards people with ID but there was no significant change in attitude
Smith, C. & Forrester-Jones, R. (2014).	62 undergraduate students learning disabilities in the UK (College)	Lectures plus two to three contacts (Combined Instruction)	Mild to moderate learning disabilities(Intellectual)	Change of attitude towards people with learning disabilities after experiencing direct contact
Sullivan, E., & Glidden, L. (2014).	33 college swim team members in the US (College)	Swim program with Special Olympic swimmers (Contact)	Intellectual and developmental disabilities(Intellectual)	Participation in program increased positive attitudes
Tracy, J., & Iacono, T. (2008).	128 undergraduate pre-medical students in Australia (College)	Contact plus education (Combined Instruction)	ID, with some physical and/or sensory disabilities(Intellectual, Physical, Sensory)	Significant positive change in attitude, better understanding and more comfortable feeling
Walker, J., & Scior, K. (2013).	403 College students in the UK (College)	10-minute film (Formal Instruction)	Intellectual disabilities(Intellectual)	Changed inclusion attitudes and social distance
Wozencroft, A., Pate, J., & Griffiths, H. (2015).	84 students in a service learning class in the US (College)	Contact plus education (Combined Instruction)	Diverse disability(Physical, Sensory, Mental)	Significant change in attitudes at the end of the course
Yazdani, N., Yazdani, F., & Nobakht, L. (2016)	14 students in a rehabilitation master's	Semester long lecture (Formal Instruction)	The general disability population (General)	Students became more accepting of people with disabilities

	program, UK (College)			
Zychlinski, E., Ben-Ezla, M., & Raz, Y. . (2016).	150 social work students in Israel (College)	Service learning course plus contact (Combined Instruction)	The general disability population (General)	No significant overall change in attitude.

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Studies are alphabetically sorted - Category in parentheses

### Implications

This systemic review identified 35 articles about intervention methods to change attitudes toward disabilities among different groups of individuals. In this review, most interventions were found to improve attitudes towards people with disabilities. Professionals in the rehabilitation field would benefit from an understanding of the impact of interventions on attitudes and awareness about the harmful experience of those with disabilities in society. The research on these interventions demonstrated effective approaches to reduce attitudinal barriers toward people with disabilities.

Of the 35 studies included, 31 showed a positive attitudinal change among participants, and just four showed no changes in perceptions, behaviors or attitudes. Only Gannon and McGiloway (2009), Phadraig et al. (2015), Sinai, Strydom and Hassiotis (2013), and Zychlinski et al. (2016) identified no changes in attitudes. All the studies with positive results suggest that interventions increase awareness and perspectives on the experience of those with disabilities in society. For instance, participants explained that the experience of being in a wheelchair led to negative social interactions and physical barriers, which then caused feelings of inferiority and lowered self-esteem (Amosun et al., 2005). An increased sense of awareness could help to positively change current misperceptions and improve attitudes towards people with disabilities (Burke et al., 2013)

The majority of the studies (24) were carried out in many countries around the world with eleven in the United States. While most people in the United States may seem to agree with the rights of people with disabilities, there is still discrimination and prejudice experienced by people with disabilities (Smart, 2009). Globally, social and legislative changes have also attempted to reduce discrimination towards people with disabilities. Efforts to change stigma toward disabilities have been found to be effective, suggesting that contact between the general public and people with disabilities may positively change prejudicial attitudes, especially mental illness stigma (Corrigan & Penn, 2015). Using interventions toward disabilities would likely decrease negative attitudes, thus potentially improving the quality of life and social inclusion of people with disabilities. These findings support evidence based practices that can be used by rehabilitation professionals to decrease stigma toward disabilities.

If, as appears to be the case in this review, attitude intervention in all its various forms is almost always successful in improving attitudes, rehabilitation professionals and researchers should consider ways to incorporate these methods into practice. Knowledge and contact seem useable tools to influence attitudes in a variety of interventions. The findings reported by Fichten et al (2005) exemplified how volunteer contact had a great impact on reducing social distance while improving self-focused views of attitudes, comfort, and thoughts about disabilities, including more favorable views about people who have a hearing impairment. Rehabilitation professionals and researchers can use information to increase knowledge and promote contact as useable tools to influence attitudes in a variety of social and educational settings.

Contact can help to improve attitudes but having people with and without disabilities work together to achieve a common goal can have long term impact on attitudes (Johnson, 2006). Rehabilitation professionals can structure activities with consumers and employers as part of the rehabilitation process. In the work settings, rehabilitation professionals and clients with disabilities work together but collaboration on goal achievement can offer opportunities to decrease prejudice and stigma toward disabilities. Stigma can hinder goal attainment; however, involvement in evidence-based practices supports the achievement of life goals and reduces negative attitudes toward disability (Corrigan, Larson, & Rusch, 2009). Therefore, collaboration between stakeholders involved in the rehabilitation process – consumer, professionals, employers, among others -can contribute to promote inclusion and positive views of disabilities.

Nonetheless, Sinai, Strydom and Hassiotis (2013) suggested that didactic teaching and limited exposure to people with intellectual disabilities increases knowledge but may not be enough to improve attitudes. With this finding, rehabilitation professionals and employers might want to assess their audience to determine a feasible intervention before assuming that just any intervention would be effective in attitudinal changes. In order to effectively generate a potential positive shift in attitude toward disabilities, rehabilitation professionals need to evaluate each intervention separately. While assessing the intervention for attitudinal change, the rehabilitation professional should consider the cognitive ability, developmental stage, emotional readiness, previous experiences, and motivation of the targeted audience. These considerations can increase the effectiveness of the applied intervention to reach the goal of enriched quality of life for people with disabilities.

Although this systemic review contributes to the value of interventions to change attitudes, there are some important methodological limitations. The search utilized only relevant databases and not a review of reference lists, as recommended by Bettany-Slatnikov (2010a, 2010b). Since it could be difficult to review each potential study, there is possible human error for excluding a feasible study. Due to discovering the ubiquity of international research on attitude intervention, the resulting 35 articles analyzed in this review were deemed representative, if not exhaustive. Another limitation is that the evidence comes mainly from cross-sectional attitude surveys using convenience and student samples. Results should be interpreted with reasonable caution considering potential methodological limitation and external factors that could influence the outcomes. Since 88% of the participant samples in this review showed a positive change in attitudes after being part of an intervention, rehabilitation professionals and instructors should keep these approaches in mind as an area of concern and attitudinal transformation.

It is recommended that future research should migrate from attitude intervention with small samples to broader inquiries into what effect improved attitudes have on societal inclusion of people with disabilities. Furthermore, research could also continue to assess interventions in community and vocational settings (Bartram & Cavanagh, 2019) as well as interaction focus on the human-animal bond (Silcox, Castillo, & Reed, 2014). Some of the studies reached larger audiences in public settings leading to a positive attitudinal change that could translate into opportunities for marginalized groups, improved policy, and voices for advocacy. As example of potential community impact, Kirkwood and Stamm (2006) explained that even though attitude changes were minimal in their study of Idaho citizens, the mild decreases in stigma and increases in awareness of mental health services resulted in a rise in referrals for children with mental disorders. In addition, research could also evaluate external and internal factors to better identify ways to change attitudes toward disabilities with short and long term impact including vocational interventions.

## Conclusions

Therefore, a valuable contribution of this research supports that interventions can change attitudes towards disability fostering inclusion, equity opportunities, and quality of life. There seems to be an implicit understanding that interventions can enhance attitudes towards disabilities decreasing barriers and increasing social connections. Results highlight the role of attitudinal intervention with potential implication in vocational, recreational, social, and political arenas for people with disabilities.

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