



A systematic review of mentorship programs to facilitate transition to post-secondary education and employment for youth and young adults with disabilities

Sally Lindsay, Laura R. Hartman & Melissa Fellin

To cite this article: Sally Lindsay, Laura R. Hartman & Melissa Fellin (2015): A systematic review of mentorship programs to facilitate transition to post-secondary education and employment for youth and young adults with disabilities, *Disability and Rehabilitation*, DOI: [10.3109/09638288.2015.1092174](https://doi.org/10.3109/09638288.2015.1092174)

To link to this article: <http://dx.doi.org/10.3109/09638288.2015.1092174>



Published online: 24 Oct 2015.



Submit your article to this journal [↗](#)



Article views: 41



View related articles [↗](#)



View Crossmark data [↗](#)

REVIEW PAPER

A systematic review of mentorship programs to facilitate transition to post-secondary education and employment for youth and young adults with disabilities

Sally Lindsay^{1,2}, Laura R. Hartman¹, and Melissa Fellin¹

¹Holland Bloorview Kids Rehabilitation Hospital, Bloorview Research Institute, Toronto, Ontario, Canada and ²Department of Occupational Science & Occupational Therapy, University of Toronto, Toronto, Ontario, Canada

ABSTRACT

Purpose: Youth with disabilities experience barriers in transitioning to Post-Secondary Education (PSE) and employment. Mentorship programs provide a promising approach to supporting youth through those transitions. This paper aims to identify the effective components of mentorship programs and describe participants' experiences. **Method:** We undertook a systematic review of mentorship interventions for youth and young adults with disabilities. We searched seven electronic databases for peer-reviewed articles published in English between 1980 and 2014. We included articles that examined mentorship interventions focused on PSE or employment outcomes among youth, aged thirty or younger, with physical, developmental, or cognitive disabilities. **Results:** Of the 5068 articles identified, 22 met the inclusion criteria. For seven mentorship interventions, at least one significant improvement was reported in school- or work-related outcomes. Mentorship programs with significant outcomes were often structured, delivered in group-based or mixed formats, and longer in duration (>6 months). Mentors acted as role models, offered advice, and provided mentees with social and emotional support. **Conclusions:** Evidence suggests that mentorship programs may be effective for helping youth with disabilities transition to PSE or employment. More rigorously designed studies are needed to document the impact of mentorship programs on school and vocational outcomes for youth with disabilities.

ARTICLE HISTORY

Received 11 March 2015
Revised 27 July 2015
Accepted 6 September 2015
Published online 7 October 2015

KEYWORDS

Peer mentor, youth, employment, school, post-secondary education, adolescent

► IMPLICATIONS FOR REHABILITATION

- Mentorship interventions have the potential to effectively support youth with disabilities as they transition to post-secondary education and employment.
- Youth should consider participating in formal mentorship interventions, and clinicians and educators should encourage them to do so, to enhance social, educational, and vocational outcomes.
- When developing interventions, clinicians should consider incorporating the effective components (i.e. duration, content, format) of mentorship interventions identified in this paper. Future mentorship programs should also contain a rigorous evaluation component.
- Clinicians can help to create (build content, consult on accessibility), connect (youth to program, program to community agencies), and contribute to mentorship interventions.

Introduction

Many youth, especially those with disabilities, find the transition to Post-Secondary Education (PSE) and employment challenging. Despite their potential to contribute to the labor force, people with disabilities are persistently under-represented in PSE and paid employment [1]. For instance, only 59% of youth, aged 18–21, with disabilities attend PSE, compared to 72% of youth without a disability [2]. Although the *Charter of Rights and Freedoms* [3] and the *Human Rights Act* [4] guarantee equality and prohibit

discrimination, the International Classification of Functioning (ICF) framework acknowledges the complexity of environmental factors that shapes one's ability to access PSE [5], and people with disabilities continue to encounter barriers and discrimination in entering PSE and the workforce [2,6]. The accessibility of PSE is an essential component of the socio-economic wellbeing of societies and quality of life among youth [7]. As such, making education and employment accessible to youth with disabilities is critical.

Many governments are increasingly promoting the inclusion of people with disabilities to help address labor shortages [8]. Although the employment rates of people with disabilities vary by country, the trends are often the same where people with disabilities have significantly lower employment rates compared to people without disabilities [1,11]. Most people with a disability are unemployed but want to work—and their disabilities do not prevent them from doing so [10,11]. Further, many youth with disabilities now attend post-secondary education [12]. Thus, enhancing strategies to recruit and retain people with disabilities in PSE and labor markets is critical to reducing barriers to their participation. School, vocational programs, and disability support services can be instrumental to their acquisition of skills to help improve their employment outcomes. For example, attainment of PSE credentials improves labor-market outcomes for people with disabilities, and it represents an important mechanism for narrowing the gap in employment [2,13,14]. College graduates with disabilities are 63% more likely to be employed than people with disabilities who lack PSE credentials [13,15]. Therefore, more efforts are needed to enable youth with disabilities to participate in PSE programs [16].

One promising approach to reducing barriers to PSE and employment is the use of mentorship programs, which offer benefits to at-risk youth, such as those with disabilities [17]. Mentorship relationships entail the provision of ongoing guidance, instruction, and encouragement to promote competence [17]. Mentoring reflects a unique relationship between individuals and is considered a learning partnership [18]. Further, mentoring is a process that is defined by the types of support provided by a mentor to the mentee [18]. A mentoring relationship is reciprocal but often asymmetrical, where although a mentor may benefit from the relationship the primary goal is for growth and development of the mentee. Finally, mentoring relationships are dynamic whereby the relationship often changes over time [18].

Mentors are often used to support mentees in areas of academic, career, and/or social competence [19,20]. Among typically developing youth, successful mentorship programs have been found to be safe, feasible, and acceptable to participants, and they offer a cost-effective way to augment school and vocational services [20–24]. Consistent evidence suggests that effective-mentorship interventions can also have benefits for youth with disabilities, in terms of job training, educational attainment, career supports, social skills, self-esteem, attendance, and work ethic [18,21,25–29]. As an added benefit, mentorship programs can also increase awareness of the talents of people with disabilities among educators and

employers, while reducing misconceptions, stigma, and discrimination [18,30].

The literature on mentorship programs for youth with disabilities is growing; however, it has not yet been synthesized. It is critical to identify the effective components of interventions, particularly given substantial variations in their delivery, contents, and duration. Standardization is currently lacking—and more evidence-based practices are needed to support the participation of students with disabilities in PSE programs [31].

The objectives of this systematic review are: (1) to critically appraise and synthesize best practices and effective components (i.e. content, format, delivery, duration, cost, quality, outcomes) of mentorship interventions that target academic and vocational outcomes for youth with disabilities; (2) to understand the experiences of youth with disabilities in mentorship programs; and (3) to highlight gaps in understanding and areas for future research. By identifying ways to augment transition services and promote improved PSE and employment outcomes among youth with disabilities, this review can help to inform the development and implementation of educational and vocational training. By addressing barriers to PSE access, engagement, and transition, the findings can help promote greater accountability among decision makers and increased standardization of support services for students with disabilities. This review is particularly relevant in light of calls by educational leaders and decision makers for enhanced PSE pathways for youth with disabilities and greater collaboration across ministries, school boards, and community partners to service those students [32].

Methods

We conducted this systematic review to appraise available evidence on mentorship interventions for youth with disabilities and provide recommendations on best practices. We followed the guidelines outlined in the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) Statement to ensure transparent and complete reporting [33,34].

Search strategy and data sources

Our research team developed a search strategy in consultation with an experienced hospital research librarian. We conducted a series of electronic searches for peer-reviewed literature using the following databases: MEDLINE (OVID), HealthStar, CINAHL, EMBASE, ERIC, Sociological Abstracts, and PsycInfo (Table 1).

Table 1. Search strategy.

Subject	Search terms
Disability	disab* Disabled Children (MeSH) cerebral palsy Cerebral Palsy (MeSH) spina bifida Spinal Dysraphism (MeSH) spinal cord injur* Spinal Cord Injuries (MeSH) congenital adj1 disorder* amput* Amputees (MeSH) Amputation (MeSH) cerebrovascular accident* cerebral vascular accident* stroke* Stroke (MeSH) congenital anomal* congenital adj1 anomal* Congenital Abnormalities (MeSH) hydrocephal* Hydrocephalus (MeSH) juvenile arthritis Arthritis, Juvenile (MeSH) muscular dystroph* Muscular Dystrophies (MeSH) orthopedic adj1 condition* congenital malformation*
Peer support/mentorship	peer* peer support* peer-to-peer peer counsel* social support* Social Support (MeSH) mentor* Mentors (MeSH) self-help Self-Help Groups (MeSH) support group* employ*
Employment	employment Employment (MeSH) skill adj3 develop* vocational training vocational education Vocational Education (MeSH) labor market* Labor market* work adj1 prepar*
Education	post-secondary education postsecondary education Education, Professional (MeSH) higher education college* university* Universities (MeSH)
Age	child* adolescen* youth* teen* young adult*

Indicates all variation of word after this point are applicable; adj# indicates that surrounding words/phrases are adjacent within the number indicated (e.g. "work adj1 prepar" could return "work preparation." "preparation for work," "preparing to work," etc.).

We searched for subject headings and MeSH terms related to mentorship (mentor*, peer support, social support, peer counseling, peer-to-peer), youth (youth*, adolescen*, young adult*, teen*), disability (disab* and a

broad list of disabilities), employment (employ*, skill development, vocation*, labor market, work preparation), and education (post-secondary education, higher education, college, university) (Table 1). We limited our search to items published between 1980 and 2014. We made minor modifications to our search strategy as needed within individual databases. To identify additional publications, we also manually reviewed the reference lists of articles selected for inclusion.

Article selection

Our review focused on empirical research exploring the influence of mentorship interventions on academic and vocational outcomes, or qualitative experiences of them, among youth with disabilities. Eligible articles met the following criteria: (1) reports on an intentional mentorship program or intervention. We draw on commonly used mentorship definitions that refer to mentorship as providing guidance, encouragement and support to enhance competence building and character of the mentee [17,18]. Although mentor typically refers to someone who is older than the mentee we also included peer, near-peer, adult, lay or professional mentors to reflect the various forms of mentorship; (2) the mentoring program or intervention targets youth and/or young adults, aged 14–30 or average age <30 (3) reports a sample with at least 50% of participants having a disability, defined as impairment, activity limitation, and participation restriction [5]; (4) assesses a statistically evaluated outcome of the effect of the mentor program/intervention (e.g. school (e.g. high school, college or university) or employment-related outcome); or qualitative experiences of youth who have participated in a mentorship program related to PSE or employment; (5) published in English in a peer-reviewed journal between 1980–2014. We excluded studies that focused on pre-school or elementary age youth, program descriptions, opinion articles, conference proceedings, book chapters, gray literature, dissertations, and theses (Figure 1).

We imported identified articles into *Endnote*© and removed duplicates. We used an iterative process to identify eligible articles [35]. Two researchers, trained in conducting systematic reviews, independently applied the inclusion criteria to screen titles and abstracts for relevance. Then, the researchers independently reviewed potentially relevant articles in full. We agreed on the majority of the articles for inclusion (over 90%). The remaining articles were discussed amongst the research team until consensus was reached. They kept a journal of inclusion and exclusion decisions as part of an audit trail [36].

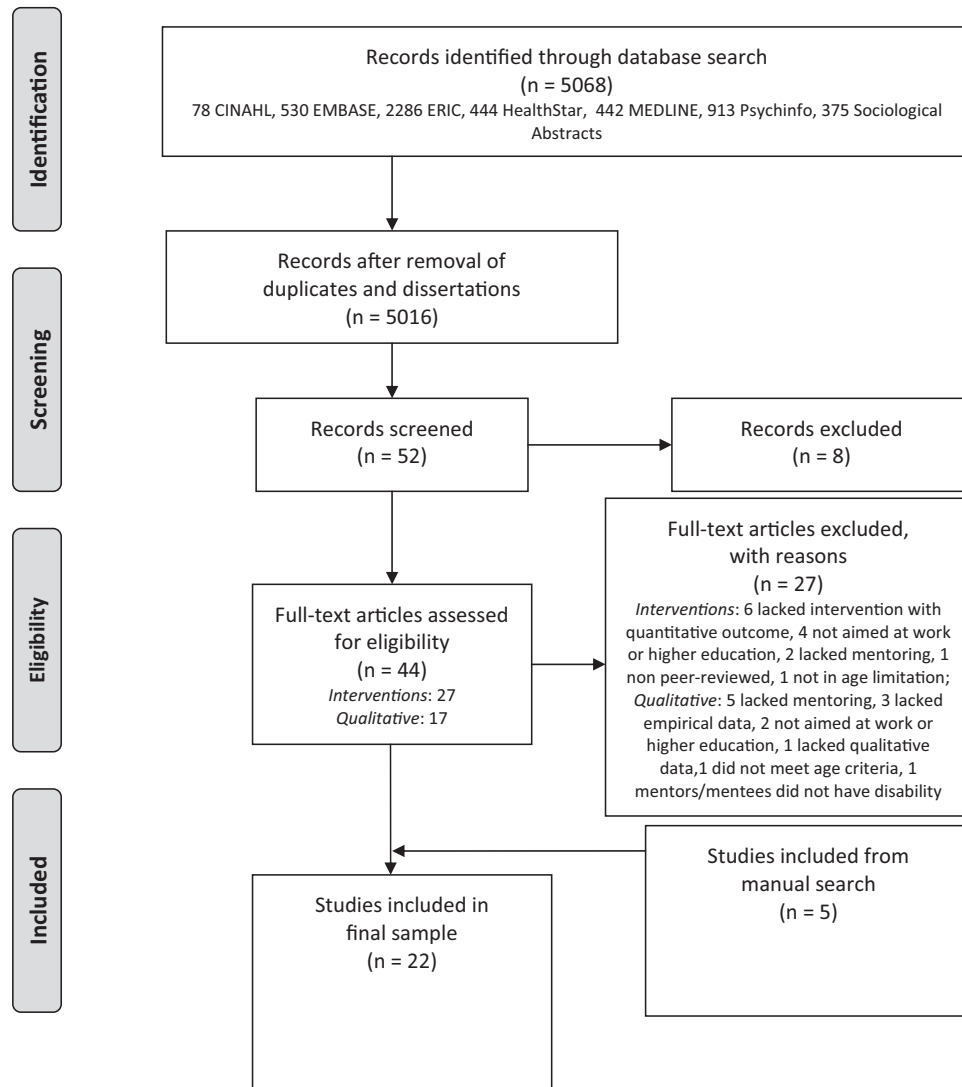


Figure 1. Search process flow diagram.

Data abstraction and synthesis

Two researchers extracted and compiled data from the included articles. A third investigator verified the accuracy of the information. If data were missing from an article, we contacted the authors for additional information. For studies employing mixed qualitative and quantitative evaluations of interventions, we abstracted data using both qualitative and quantitative abstraction methods. We also noted limitations and risk of bias for each article.

Given the heterogeneity of the articles reviewed, a meta-analysis was not feasible. We synthesized the findings according to guidelines for narrative synthesis [35]. Aided by a data abstraction form, we organized the articles into categories—by type of mentorship program, where and how the program was delivered, by whom it was delivered, and its duration—to guide ongoing analysis. Second, we performed a within-study analysis,

developing a narrative description of each article's findings and quality [35]. Third, we conducted a cross-study synthesis to identify effective intervention components, recommendations for future research and practice, and general benefits of mentorship-based interventions. After the analysis was complete, all authors reviewed common elements of the interventions, which we discussed as a research team until consensus was reached. All three researchers agreed on the final coding process [35]. We produced a summary of findings, incorporating study design, quality, and sample.

Methodological quality assessment

We classified the articles reviewed according to the American Academy of Neurology (AAN) Classification of Evidence [37], which was helpful for informing

evidence-based guidelines. Using this system, two researchers independently reviewed each article and assigned an AAN class, while noting any limitations in the reported study. They resolved any discrepancies in ratings through discussion. The research team has taken these ratings of the strength of reported evidence into account when making our recommendations for further studies and mentorship interventions [37].

We also assessed the methodological quality of reported evidence using three scales, based on each article's research methodology: the Physiotherapy Evidence Database (PEDro) scale [38], the Strengthening of the Reporting of Observational Studies in Epidemiology (STROBE) assessment tool [39] and the Critical Appraisal Skills Program (CASP) Quality Research Checklist [40]. We assessed three of the articles, which reported randomized trials with an AAN rating of class III, using the PEDro scale [21,38,41,42] (Supplementary Table 1). This scale is used to assess 11 quality criteria expected for randomized trials. One point is awarded for the presence of each criterion, and zero points were awarded for its absence, resulting in a total possible score of 11. We assessed 14 other articles that reported pre- and post-test studies with a version of the STROBE assessment tool [39] (Supplementary Table 2), which is used to assess 22 quality criteria. Each criterion has a maximum score of 1 (if present) and a minimum score of 0 (if absent). Some criteria have sub-criteria, in which case the overall score of 1 is divided equally among the sub criteria (e.g. if there are 3 sub-criteria, each sub-criterion will be worth 0.33 points). There is a total possible score of 22.

We assessed four articles that reported qualitative methods of data collection and analysis using the Critical Appraisal Skills Program (CASP) Qualitative Checklist [40] (Supplementary Table 3). The CASP is a 10 question, qualitative methodological checklist to identify qualitative study's key criteria [40]. Finally, we assessed the remaining two articles [43,44], which reported both qualitative and quantitative methods of data collection and analysis, using both the STROBE assessment tool and the CASP Qualitative Checklist. We did not exclude any studies from our review due to low levels of evidence or quality; however, we did consider those parameters in forming our recommendations for future research and mentorship interventions.

Results

Study and participant characteristics

Our search yielded 5068 articles, of which 22 met our inclusion criteria for this systematic review (16 interventions, four qualitative studies, two-mixed intervention

and qualitative studies). All of the reported studies were conducted in the United States (Table 2). Sample sizes ranged from one to 2254, and the ages of mentees ranged from 14–27 years old. Six of the articles did not report the socio-demographics of the participants [21,44–48], seven of the articles reported that a majority of participants were Caucasian [41–43,49–52], and the remaining studies involved participants from various ethno-cultural backgrounds. Of the articles that specified gender composition, all but two [22,48] reported both male and female participants in their sample. The type of disability that was included across the studies varied greatly with the majority of the studies (16) focusing on several different types of disabilities within their sample. Four focused on intellectual or learning disability [22,47,51,53], and one each focused on blindness [25], spinal cord injury [52], and developmental disability [48].

None of the studies used a randomized controlled design. One [55] used a quasi-experimental design with a control group, and one used an independent group randomized block design [21]. Eleven studies entailed a repeated measures design [22,25,46–49,51–53,56]. Two used mixed methods [43–44], two involved a cross-sectional survey [44,56], and four were qualitative studies [23,28,45,57].

Methodological quality

We assessed all of the articles for methodological quality using the AAN Classification of Evidence, and we found that none provided level I or II evidence. Three provided level III evidence [21,41,42], which suggests their reported interventions are possibly effective. The remaining 20 provided level IV evidence, providing data that are inadequate to determine the effectiveness of the interventions [37].

Among the three articles we assessed for methodological quality using the PEDro scale, all three achieved 6–7 points out of a possible total score of 11. All three articles lost points related to the concealment of participant allocation and blinding of participants, therapists, and assessors. Concealment and blinding are commonly infeasible in intervention-based studies.

The 16 articles we assessed using the STROBE assessment tool achieved scores ranging from 16.23 to 20.31, out of a possible total score of 22 [22,25,43,44–56]. Points were generally lost for not providing information regarding: (1) matching criteria for controls (or not having controls); (2) biases and how they were addressed; (3) how study size was determined; (4) methods describing subgroup interactions; (5) how missing data was addressed; (6) sensitivity analyzes; (7) reasons for non-participation at each stage; (8) use of

Table 2. Characteristics and overview of studies.

Author, Year	Count.	Rcrt. setting	Study design	N (% female)	Socio-demographics	Clinical Population	Age range in years (mean)	Study quality (AAN Class)
Abery et al., 1995	USA	School	Repeated measures design	18 (56)	Suburban; average family income range from <\$20 000 to >\$65 000 annually, average >\$35 000 annually; >67% of parents attended college; 78% of families intact	100% intellectual disability	14–20 (16.5)	IV
Bell, 2012	USA	n/s	Repeated measures design	49 (57)	29% from Utah, 27% from Ohio, 24% from Georgia, 20% from Texas; 57% Caucasian, 25% African American, 10% Hispanic, 2% Native American, 2% Asian or Pacific Islander, 4% other	100% legal blindness	17–26 (21.16)	IV
Bobroff & Sax, 2010	USA	School	Repeated measures design	Mentors: 3 (67); Mentees: 3 (33)	83% Caucasian, 17% Hispanic	67% severely emotionally disturbed, 17% autism, 17% multiple handicaps	18–22 (19.3)	IV
Burgstahler & Cronheim, 2001	USA	School and community	Follow-up survey; focus groups; evaluation of e-mails	Mentors: 34 (n/s); Mentees: 40 (n/s)	n/s	Students with disabilities, including: hearing, mobility, vision, health impairments, learning disabilities (percentages n/s)	n/s (n/s)	IV
Francis et al., 2013a	USA	Community	Mixed methods: quantitative analysis of follow-up survey data, qualitative analysis of semi-structured interview data	134 (n/s)	81.3% Caucasian, 8.6% Hispanic, 3.3% Asian/Asian American, 1.9% African American, 3.8% multiple races/ethnicities, remainder n/s	34.9% autism, 22.8% developmental disability, 20.1% multiple disabilities, 5.8% learning disability, 4.8% neurological disability, 4.3% cerebral palsy, 4.2% ADHD, 2.6% emotional behavioral disorder, 1.6% medically fragile/health impairment, 1.6% speech/language impairment, 1.6% TBI, 1.1% visual impairment, 0.5% hearing impairment, 0.5% orthopedic impairment, 9% other disability, 0.5% undiagnosed but suspected disability (percentages reported do not equal 100% because the U.S. Census Bureau (2010) measured Hispanic/Latino versus not Hispanic/Latino as a separate analysis)	Transition-age youth (n/s)	IV
Francis et al., 2013b	USA	Program database	Mixed methods: quantitative analysis of follow-up survey data, qualitative analysis of semi-structured interview data	Total: 114 (n/s); Family members: 68 (n/s); Professionals: 31 (n/s); Individuals w/individualized support needs: 8 (n/s)	Families: 79.3% Caucasian, 6.9% Hispanic, 5.2% African American, 3.4% Asian/Asian American, 5.2% multiple races; Average annual household income 12% below \$35000, 64% above \$65000; Individuals with individualized support needs: 83.3% Caucasian, 0.9% African American, remainder n/s	Individuals w/individualized support needs: 17% autism; 33% multiple disabilities; 33% cerebral palsy; 17% hearing impairment/deafness	Individuals w/individualized support needs: 17% 16–18 years, 50% 22–25 years, 33% >26 years	IV

(continued)

Table 2. Continued

Author, Year	Count.	Rcrt. setting	Study design	N (% female)	Socio-demographics	Clinical Population	Age range in years (mean)	Study quality (AAN Class)
Grenwelle & Zhang, 2013	USA	School	Quasi-experimental non-equivalent group design	Intervention: 34 (56); Control: 34 (53)	Intervention: 44% Hispanic, 35% Caucasian, 21% African American; Control: 47% Hispanic, 35% Caucasian, 18% African American	Intervention: 53% learning disability, 29% developmental disability, 18% physical disability; Control: 53% learning disability, 29% developmental disability, 18% physical disability	Intervention 15–21 (17.63); Control: 16–21 (17.62)	IV
Hillier et al., 2007	USA	Community	Repeated measures design	13 (15)	n/s	61% Asperger Syndrome, 31% pervasive developmental disorder (not otherwise specified), 8% autism	18–23 (19)	IV
Kim-Rupnow & Burgstahler, 2004	USA	School and community	Cross-sectional post-intervention survey	75 (48)	n/s	41% mobility-related disability, 13% sight-related, 12% learning-related, 9% hearing-related, 1% speech-related, 23% other	1% under 18; 8% 18–20; 47% 21–23; 33% 24–26; 11% over 26	IV
Likins et al., 1989	USA	Workplace	Intervention #1: multiple baseline across participants, repeated measures Intervention #2: alternating treatments design, multiple baseline across participants	Intervention #1: Participants: 3 (100); Trainers: 2 (n/s) Intervention #2: Participants: 3 (100); Trainers: 2 (n/s)	Intervention #1: n/s Intervention #2: n/s	Intervention #1: 100% mild intellectual disabilities Intervention #2: 100% mild or moderate intellectual disabilities	Intervention #1: Participants: 24–32 (27) Intervention #2: Participants: 23–24 (23)	IV
Maheady et al., 1988	USA	School	Repeated measures return to baseline design (ABAB)	Total: 50 (46); Participants w/ disabilities: 14 (50)	52% Caucasian, 44% African American, 4% Native American	100% learning disability or behavioral disorder	Participants w/disabilities: 15–17 (16.75)	III
Powers et al., 1995	USA	School	RCT	Intervention: 5 (60); Control: 5 (60); Mentors: 5 (60)	n/s	Intervention: 80% cerebral palsy, 20% spina bifida; Control: 40% cerebral palsy, 20% muscular dystrophy, 20% spina bifida, 20% juvenile rheumatoid arthritis; Mentors: 40% multiple sclerosis, 40% cerebral palsy, 20% rheumatoid arthritis	Intervention: 12–19 (16.6); Control: 12–19 (16.2)	III
Powers et al., 2001	USA	School	RCT	Intervention: 21 (38); Control: (23)	74% European American, 14% Hispanic, 7% African American, 5% Asian; 33% from New Hampshire, 23% from Wisconsin, 23% from North Carolina, 21% from Oregon	42% learning disability, 9% orthopedic disability, 5% emotional disability, 2% primary health impairment, 42% combination	14–17 (15.5)	III
Powers et al., 2012	USA	Foster care system	RCT	Intervention: 29 (41.4); Control: 32 (40.6)	Intervention: 41.4% Caucasian, 17.3% African American, 10.3% Native American, 3.4% Hispanic, 20.7% Multi-ethnic, 6.9% other; Control: 59.4% Caucasian, 15.6% African American, 12.5% Hispanic, 9.4% Native American, 3.1% Multi-ethnic	Intervention: 31% learning disabilities, 27.6% emotional/behavioral issues, 17.2% speech/language disabilities, 10.3% intellectual disabilities, 34.5% other; Control: 53% Emotional/Behavioral Issues, 21.8% Learning Disabilities, 15.6% Speech language disabilities, 9.4% Intellectual disabilities, 9.4% Autism spectrum disorder, 3.1% physical disabilities, 40.6% Other health impairment	Intervention: 16.5–17.5 (16.8) Control: 16.5–17.5 (16.9)	III

(continued)



Table 2. Continued

Author, Year	Count.	Rcrt. setting	Study design	N (% female)	Socio-demographics	Clinical Population	Age range in years (mean)	Study quality (AAN Class)
Shandra & Hogan, 2008	USA	National survey data	Repeated measures design	2254 (44.7)	23.6% African American, 15.9% Hispanic; 76.8% had high school degree; 15.9% at 0–100 income to poverty ratio, 22.9% at 101–200 income to poverty ratio	Children with disabilities, including learning or emotional disabilities, sensory limitations, physical disabilities, or chronic illness; 32.5% had moderate disabilities, 9.3% had severe disabilities	22–26 (n/s) at time of survey	IV
Shem et al., 2011	USA	n/s	Repeated measures design, prospective	Total: 39 (28); Completed intervention: 10 (40)	Total: 31% Caucasian, 54% Hispanic; 10% African American; 5% other; Completed intervention: 40% Caucasian, 40% Hispanic, 20% other	100% spinal cord injury	Total: 16–26 (19.8); Completed intervention: 16–26 (20.3)	IV
Storey & Graff, 1997	USA	Community	Repeated measures design (A-B1-B2-B3-C)	1 (100)	n/s	100% developmental disability, including emotional and mental disturbances, moderate intellectual disability, and sensory integration problems	27 (27)	IV
Westerlund et al., 2006	USA	School	Multiple baseline across behaviors; repeated measures	Mentees: 4 (100); Mentors: 4 (75)	Mentees: 75% Greek descent; 25% Caucasian; Mentors: 50% African American; 25% Caucasian; 25% Asian	100% specific learning disabilities and severe emotional disturbances	Mentees: 16–18 (n/s)	IV

RCT = randomized controlled trial; AAN [64] Class I = rigorous RCT; Class II = matched prospective cohort studies or RCTs in a representative population lacking one of the criteria in class I; Class III = all other controlled trials; Class IV = non-controlled trials.

flow diagram; and (9) translating relative risk into absolute risk.

None of the six articles we assessed using the CASP Quality Research Checklist adequately met research quality standards. In those articles, it was unclear if researchers had adequately considered their relationship with the participants or taken ethics into consideration. In three [23,44,45] of the six articles, the reported data analysis was also insufficiently rigorous. Furthermore, while we found that qualitative research was suited to all six studies, two of the articles [43,45] reported research designs that were inappropriate for the stated research objectives. In one of those studies [43], the data collected did not address the research issue. The other study [45] did not entail an appropriate recruitment strategy.

Types of interventions

The articles reported on several types of mentorship interventions (Table 3), including: school-based [22,49,51,53], community-based [21,46,52,55], work-based [47,48], family employment awareness training [43,50], online [44,45], multi-component [25,41,42,56], and other mentorship interventions [56].

School-based interventions

Abery et al. [53] evaluated an intervention involving a classroom-based competency-building program aimed at fostering self-determination among youth, aged 14–20, with intellectual disabilities. The intervention was delivered in small groups of three to eight students and involved discussions, role-playing, group activities, and parental involvement. Two instructors (adult mentors with a disability) delivered the program. It included 24 sessions, lasting 90-min each, over a period of seven months [53].

Bobroff and Sax [49] conducted a pilot study to explore the impact of a one-to-one, school-based peer tutoring program that aimed to develop interview skills among transition-aged students with severe emotional, developmental, or multiple disabilities—including students with disabilities who had employment experience or desired work experience. The intervention consisted of 30-min sessions twice per week for 11 weeks. It entailed meetings, practice homework, and teacher involvement [49].

Maheady et al.'s [51] standardized school-based intervention entailed class-wide peer tutoring for youth, aged 15–17 years old, with learning or behavioral disabilities. It consisted of one daily 30-min session, twice per week. The class was divided into teams, with

team members divided into dyads. Study guides were used to facilitate peer learning, and points were awarded for correct answers to questions and good tutoring behavior. The team with the most points at the end of each two-week interval won, and new teams were formed for the next session. Individual achievements were also recognized [51].

In another school-based intervention, led by Westerlund et al. [22], peer mentors helped youth with learning or severe-emotional disabilities develop skills to achieve several target behaviors, using non-stigmatizing natural support in a vocational school setting. This individualized program entailed meetings and practice homework for each mentor and mentee. The mentor modeled each task, allowed the participant to demonstrate the task, and provided descriptive praise or corrective feedback. While each participant received 20 to 32 sessions, the duration of sessions was not specified [22].

Community-based interventions

Four of the interventions were community-based. For example, Grenwelge and Zhang's [55] "Texas Statewide Youth Leadership Forum" involved a training curriculum aimed to address skills for those with a disability, team building and leadership, self-advocacy, legislative advocacy, post-secondary education, employment, and volunteerism. The program targeted youth, aged 15–21, with a variety of disability types. Trained peer mentors (youth with disabilities) delivered the intervention, using an experiential and interactive approach. It was a standardized program, which took place over the course of five days; however, the length and duration of sessions were not specified [55].

Hillier et al.'s [46] community-based "Aspirations" intervention aimed to address a range of social and vocational issues among youth, aged 18–23, with autism, Asperger's, or pervasive development disorder. Over the course of eight weeks, trained mentors led eight group-based sessions, lasting 1-h each [46].

Powers et al.'s [21] one-to-one intervention was based on the "Reach for Independence and Self-Confidence" (RISC) program. Mentors and mentees engaged in activities aimed to build self-efficacy among youth, aged 12–19 years old, with cerebral palsy or spina bifida. Over a period of two months, adult mentors with disabilities lead nine one-on-one sessions and three 2-h conferences. The intervention also entailed phone contact with mentors and the study coordinator and family involvement [21].

Shem et al.'s [52] one-to-one mentorship program connected youth, aged 16–26, who had spinal cord

Table 3. Intervention components.

Author, Year	Intervention	Delivery by	Delivered to	Role of mentor	Mentor training	Delivery Setting	Intervention Format (medium)	Delivery Format	Meetings	Practice/Homework	Phone Contact	Supporter Involvement (level of involvement)	No. of Sessions (Length)	Duration
Abery et al., 1995	A classroom-based competency-building program aimed to foster self-determination among small groups of three to eight students. It was partially didactic and partially experiential, using discussion, role-playing, and group activities.	Two instructors associated with the project; adult mentor with disability	Adolescents with disabilities; family members	Supported instructors and students by leading discussions and activities, reinforcing student progress, and serving as role models inside and outside of the sessions.	n/s	Classroom	G (in-person)	S	Y	Y	n/s	Parent (I)	24 (90 minutes)	7 months
Bell, 2012	A multi-state mentorship program for youth and young adults with legal blindness targeted youth knowledge and attitudes toward employment and higher education. It consisted of individual mentor-mentee meetings and relationships as well as group-based activities.	Adult mentor with blindness who achieved successful employment or academic success	Youth/young adult with legal blindness	Provided direct mentorship, support, and guidance to mentees.	n/s	Multiple (community, phone, online)	O (in-person, phone, online); G (in-person)	S	Y	N	Y	n/s	>8 hours/month of face-to-face contact, plus additional time with other forms of communication	2 years
Bobroff & Sax, 2010	A pilot-study peer tutoring program targeted interview skills among transition-aged students with disabilities. Both tutor and tutee groups included students with disabilities who had experience or desired experience in the workforce.	Peer-mentor tutor who had had at least 1 job interview and shown interest in peer mentoring	Peer mentees (tutee) with disabilities	Mentor was tutor with disability who has had a real vocational interview in the community	Peer mentors were trained on instructional presentation behaviors, corrective feedback techniques, performance-monitoring techniques, and problem solving.	Classroom; professional office building for interviews	O (in-person)	I	Y	Y	n/s	Teacher (D)	Training: 2/week (30 min.); Tutoring: 7 Dyad 1: 280 min Dyad 2: 270 min Dyad 3: 340 min	Training: 4 weeks; Tutoring: 7 weeks (11 total)
Burgstahler & Cronheim, 2001	Data was collected from participants of the DO-IT (Disabilities, Opportunities, Internetworking and Technology) college preparation mentoring program using e-mail messages between mentors and participants, written surveys, and focus groups to evaluate participants' participation in the program.	Researchers; adult mentors, with and without disabilities, who were enrolled in postsecondary education or employed; and peer mentors with disabilities	Mentees (students) with disabilities	Encouraged, educated, shared accommodation strategies and employment opportunities, and discussed successes and failures with mentees. Peers worked with each other to support and challenge one another.	n/s	School and community	G and O (online)	S (activities); I (technological adaptations, interactions with mentors)	Y	n/s	n/s	n/s	In person: 2 weeks in first summer, 1 week in second session; Online: Unspecified	2 year
Francis et al., 2013a	A knowledge-based training program, Family Employment Awareness Training (FEAT), targeted	Researchers; parent-training leaders	Youth with individual support needs; families; professionals	Facilitated training activities focused on gaining and navigating	n/s	Community	G (in-person)	S	Y	n/s	n/s	Family (D); professionals (D)	9 (n/s)	2 days

(continued)

Table 3. Continued

Author, Year	Intervention	Delivery by	Delivered to	Role of mentor	Mentor training	Delivery Setting	Intervention Format (medium)	Delivery Format	Meetings	Practice/ Homework	Phone Contact	Supporter Involvement (level of involvement)	No. of Sessions (Length)	Duration
Francis et al., 2013b	employment-related knowledge among youth with individualized support needs and their families. A knowledge-based training program, <i>Family Employment Awareness Training (FEAT)</i> , targeted employment-related knowledge among youth with individualized support needs and their families.	Researchers; parent-training leaders	Youth with individual support needs; families; professionals	Facilitated training activities focused on gaining and navigating employment and networking opportunities.	n/s	Community	G (in-person)	S	Y	n/s	n/s	Family (D); professionals (D)	9 (n/s)	2 days
Grenwelle & Zhang, 2013	The <i>Texas Statewide Youth Leadership Forum (TXLYLF)</i> training curriculum targeted areas of: (a) disability history; (b) team-building and leadership; (c) self-advocacy; (d) legislative advocacy; (e) postsecondary education; (f) employment; and (g) volunteerism. The program emphasized an experiential and interactive approach to supporting the acquisition of leadership and advocacy skills.	Peer mentor volunteers with disabilities (mostly graduates of the program)	Youth with disabilities	Facilitated curriculum with participants. Peer mentors were trained on curriculum components, objectives, guidelines for participant and group interaction, and data collection rules and guidelines.		Community	G (in-person)	S	Y	n/s	n/s	N	n/s	5 days
Hillier et al., 2007	The 8-week-long <i>Aspirations</i> program aimed to foster understanding of a range of social and vocational issues, enhance insight and awareness, and provide social opportunities to group members. Sessions were directed by group members, through discussion and the sharing of personal experiences.	Group facilitators with graduate degrees and training in managing social skills; group members with disabilities	Group members with disabilities	Group members acted as both mentors and mentees, by sharing experiences and working together.	n/a	Community	G (in-person)	S	Y	n/s	n/s	Family (I)	8 (1 hour)	8 weeks
Kim-Rupnow & Burgstahler, 2004	The components of the <i>DO-IT Scholar Program</i> were delivered: (1) the <i>Technology Enriched Summer Study</i> program allows for in-	Adult mentors with disabilities; group members (students) with disabilities	Group members (students) with disabilities	Helped to facilitate learning by sharing information and experiences; sharing opinions.	n/s	Community and online	G (in-person and online)	S (activities); I (technological adaptations, interactions with mentors)	Y	n/s	N	N	n/s	3 years

(continued)

Table 3. Continued

Author, Year	Intervention	Delivery by	Delivered to	Role of mentor	Mentor training	Delivery Setting	Intervention Format (medium)	Delivery Format	Meetings	Practice/ Homework	Phone Contact	Supporter Involvement (level of involvement)	No. of Sessions (Length)	Duration
Likins et al., 1989	person training targeting social and vocational skills and involves young people with disabilities and adult mentors; and (2) year-round computer and Internet activities connected the same peers and mentors to provide ongoing academic and career development support through computer-mediated communication. INTERVENTION #1: Two coworker mentors trained participants with intellectual disabilities in salad preparation, using incidental training methods. Participants were observed during the following phases: (1) baseline; (2) coincidental training; (3) coincidental training with quality control checking; (4) 2-day maintenance checks; and (5) weekly maintenance checks. INTERVENTION #2: Similar procedures to those followed in Intervention #1 were implemented. Error correction and step-specific checking were recorded for steps involved in the salad-making process.	Coworker mentors (university students working in the food preparation facility)	Participants with intellectual disabilities	Trained employe in workplace tasks. questioning ideas, and weighing arguments.	Coworker mentors had previous work experience in other self-service restaurants on campus and received ongoing supervision from the restaurant's department supervisor.	Work	O (in-person)	S	n/s	Y	n/s	n/s	n/s (20–25 min)	<6 months
Maheady et al., 1988	<i>Class-wide Peer Tutoring</i> (CWPT) was provided for 30 minutes per day, twice per week. The class was divided into two teams, and team members were divided into dyads. Students used study guides to facilitate peer learning through guiding	Same-age classroom peers (students), with and without disabilities	Same-age classroom peers (students), with and without disabilities	Quizzed and were quizzed by peers with and without learning disabilities and behavioral issues.	n/a	School	O (in-person)	S	N	N	n/s	n/s	n/s (30 min)	20 weeks

(continued)

Table 3. Continued

Author, Year	Intervention	Delivery by	Delivered to	Role of mentor	Mentor training	Delivery Setting	Intervention Format (medium)	Delivery Format	Meetings	Practice/Homework	Phone Contact	Supporter Involvement (level of involvement)	No. of Sessions (Length)	Duration
Powers et al., 1995	<p>questions and received points for correct answers to questions and good tutoring behavior. The team with the most cumulative points at the end of each two-week interval won.</p> <p>A one-to-one mentorship program, based on the <i>Reach for Independence and Self-Confidence</i> (RISC) program, used mentor-mentee activities to target self-efficacy and strategies among mentees. Participants were compared to a control group of peers.</p>	Coordinator; adult mentors with disabilities who were living independently	Mentees with disabilities	Participated in activities with mentees and provided information or model adaptive strategies related to the activity.	Mentors received 4 hours of training on roles and procedures.	Community	O (in-person)	S (topics); 1 (activities)	Y	n/s	Y (mentor and coordinator; student, family, and coordinator)	Family (I)	One-on-one: 9 (varied) Conferences: 3 (2 hours)	2 months
Powers et al., 2001	<p>The TAKE CHARGE for the Future program provided: (a) biweekly individual coaching sessions; (b) monthly community-based workshops for youth, parents, and mentors; (c) community activities with mentors; (d) telephone and home visits support for parents; and (e) in-service education for transition staff.</p>	Coordinator; transition staff; adult mentors with disabilities who were living independently and had an active vocation	Students with disabilities; parents; mentor; transitions staff	Participated in activities with mentees and provided information or model adaptive strategies related to the activity.	Mentors received 4 hours of training on components of TAKE CHARGE for the Future, the role of mentors within the program, and the study's procedures. Mentors learned to anticipate and take advantage of opportunities that would naturally arise during their interactions with youth to demonstrate a behavior or provide information.	School and community	O (in-person) for mentoring and coaching; G (in person, phone) for all other activities	S (workshops, coaching, in-service education); 1 (mentoring)	Y	n/s	Y (with study coordinators and research teams)	Family (D); education staff (D)	Biweekly coaching: 8 (50 min); Monthly workshops: 4 (2 hour); Community activities w/ mentors: mean 1.7 (n/s); Telephone calls w/parents: mean 5.9 (n/s); Home visits w/parents: mean 2.1 (n/s); In-service education sessions w/educators: 3 (50 min)	8 months
Powers et al., 2012	<p>The My Life Study's implementation of the TAKE CHARGE for the Future program targeted youth in foster care with special needs or special education. It provided: (a) weekly individual coaching sessions; and (b) quarterly workshops</p>	Coaches; adult mentors who worked in the community or attending college, had lived in foster care, and had experience overcoming barriers to transition	Intervention: students with disabilities; Control: students with disabilities	Participated in four mentoring workshops, interacting and acting as role models for study participants.	Mentors received training to prepare them to participate in selected workshops related to their interests and expertise.	School and community	O (in-person) for coaching; G (in person) for mentoring workshops	S	Y	n/s	n/s	n/s	Treatment: Mean 12.74 months coaching, Mean 50.36 hours spent in direct coaching, Mean 2.82 workshops attended in waves 1 and 2, Mean 3.67 workshops attended in	12 months

(continued)

Table 3. Continued

Author, Year	Intervention	Delivery by	Delivered to	Role of mentor	Mentor training	Delivery Setting	Intervention Format (medium)	Delivery Format	Meetings	Practice/ Homework	Phone Contact	Supporter Involvement (level of involvement)	No. of Sessions (Length)	Duration
Shandra & Hogan, 2008	for youth mentees and young adult mentors who were formerly in foster care. Participants were compared to peers in foster care who participated in the <i>Foster Care Independent Living Program</i> .	Diverse programs delivered in school or work settings	Youth and young adult mentees with disabilities	"Mentoring" defined as "being matched with an individual in an occupation" with hopes of growing work-based knowledge.	n/s	School and community	none	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Shem et al., 2011	A one-to-one mentorship program aimed to connect youth with spinal cord injury (SCI) to mentors who had successfully gained employment to help improve community integration of youth with SCI between the ages of 16 and 26.	Mentors with or without disabilities; physician; program coordinator; program assistant; vocational Counselor; rehabilitation psychologist	Youth and young adults with spinal cord injuries	Provided knowledge of resources in the community and encouraged social, academic, and employment-related participation among mentees.	Mentors received a training curriculum on traumatic brain injury/spinal cord injury peer support, including refreshing sessions throughout the program; from a rehabilitation psychologist.	Community	O (in-person, phone, online)	I	Y	N	Y	n/s	>36 sessions (1 hour)	2 years (mean 17 months)
Storey & Graff, 1997	A work-based intervention targeted social integration among participants through three phases: (1) a non-disabled coworker taught instructional skills, and that coworker then taught the participant; (2) a non-disabled coworker encouraged other coworkers to interact with participant; (3) the participant was taught specific social interaction skills.	Researcher; peer mentor without disability (coworker)	Young adult coworker with disabilities	Directly instructed mentee and encouraged other coworkers to interact with the mentee.	During 20-minute daily training sessions with the researcher, the coworker mentor received training on instructional tactics of verbal instructions, modeling, practicing steps with corrective feedback, and praise and quality control checking.	Work	O (in-person)	I	Y	n/s	n/s	N	130 (n/s)	n/s
Westerlund et al., 2006	Peer mentors provided non-stigmatizing, natural support	Researcher; peer mentors (advanced)	Adolescent students	Directly instruct non-mentee in a	Prior to the first intervention, peer mentors	School	O (in-person)	I	Y	Y	n/s	N	10-15 (n/s)	n/s

(continued)

Table 3. Continued

Author, Year	Intervention	Delivered to	Role of mentor	Mentor training	Delivery Setting	Intervention Format (medium)	Delivery Format	Meetings	Practice/ Homework	Phone Contact	Supporter Involvement (level of involvement)	No. of Sessions (Length)	Duration
	targeting a number of behaviors. They progressively taught mentees new skills, while continuing to correct for previously instructed skills.	students in same program)	stigmatizing, supportive way	received 30–45 minutes of training on behavioral rehearsal, demonstrating a targeted task, and delivery of descriptive praise and corrective feedback.									

RCT = Randomized controlled trial, Intervention Format: O = one-on-one, G = group, Delivery format: I = individualized, S = standardized, Supporter Involvement: I = indirect, D = direct, »S = Standardized intervention; I = Individualized intervention, n/a = Not Applicable. n/s = not specified.

injury to mentors who had successfully gained employment. Through in-person, phone, and online contact, the intervention entailed 36 sessions, lasting 1-h each, over a period of two years. Mentors provided knowledge of resources in the community and encouraged social, academic, and employment-related participation among mentees. The intervention also involved a physician, program assistant, vocational counselor, and rehabilitation psychologist [52].

Work-based interventions

Two interventions took place in a work environment. Likins et al. [47] evaluated a work-based intervention through two studies among young with intellectual disabilities. The first study involved youth, aged 23–24 (mean 23), and the second involved young adults, aged 24–32 (mean 27). Two coworkers (students with experience working in a food preparation facility) trained and mentored participants in food preparation, using a standardized, one-on-one approach. This intervention entailed the preparation of a test salad (4–16 minutes), followed by the creation of a salad with coincidental training support from the coworker. The number of sessions for each participant was not specified [47].

Storey & Graff’s [48] single-case study entailed a three-phase intervention for social integration in the workplace for an employee with a developmental disability. First, a non-disabled coworker (shift supervisor at the restaurant, mentor) was taught instructional tactics for verbal instructions, modeling, corrective feedback, and praise. Then, the mentor taught the mentee specific job-related tasks. Once the mentee had become more skilled at the targeted task, the mentor encouraged her and other coworkers to interact during slow periods at the restaurant. Finally, the mentor used similar training tactics as in the job-task training to teach the mentee social interaction skills to facilitate interaction with other coworkers over the course of approximately 130 sessions of varying length. The study also entailed a maintenance phase [48].

Family employment awareness training

One intervention, “Family Awareness Employment Training” (FEAT), was described in two articles [43,50]. This group-based intervention was run by researchers and parent-trained leaders. It was a standardized, knowledge-based training program that aimed to enhance employment-related knowledge among youth with individualized support needs (i.e. youth

with autism, developmental disabilities, physical disabilities, or multiple disabilities) and their families. The intervention involved nine sessions over the course of two days [43,50].

Online mentoring

Two mentoring interventions were conducted online [44,45]. In the “DO-IT” (Disabilities, Opportunities, Internetworking and Technology) program reported by Burstahler & Chronheim [45], mentors used e-mail and in-person methods to provide college preparation support to youth with a variety of disabilities. Many of the mentors had disabilities, and they worked to encourage, educate, and share accommodation strategies, employment opportunities, and support with mentees. The research participants took part in the intervention over a two-year period [45].

Kim-Rupnow & Burgstahler [44] also evaluated some components of the DO-IT program in a second online mentorship intervention. This intervention took place over a three-year period and included a technology-enriched summer program, which allowed for in-person training in social and vocational skills. The intervention also used Internet activities to connect participants with peer mentors, who provided academic and career-development support. The majority of the exchanges occurred asynchronously via e-mail [44].

Multicomponent interventions

Three of the interventions in our review involved multiple components. Bell [25] described a multicomponent mentorship program for youth who were blind. It entailed both one-on-one meetings (in person, over the phone, and online), as well as group-based activities, which focused on improving knowledge and attitudes among youth towards employment and higher education. The mentor was an adult who was blind, and the intervention involved about 8 h of contact per month over the course of two years [25].

Powers et al.’s [41] “TAKE CHARGE for the future” intervention targeted youth, aged 14–17, with a variety of disabilities. Transition staff and adult mentors with disabilities led the intervention over a period of four months. It included eight bi-weekly one-on-one coaching sessions; four monthly 2-h-long community-based workshops for youth, parents, and mentors; telephone support and home visits for parents; and three 50-min-long in-service training sessions for educators and transition staff [41].

Powers et al. [42] further expanded on the “TAKE CHARGE for the future” program in an intervention

involving coaches, adult mentors with disabilities, and independent-living staff who supported youth with a variety of disabilities. Weekly, in-person, one-on-one coaching and quarterly group-based mentoring workshops occurred over a period of twelve months [42].

Other types of mentorship interventions

One study explored the role of mentors in school or work transitions through longitudinal, nationally representative survey. Shandra & Hogan [56] explored how mentoring influenced the impact of school-to-work transition programs among youth with moderate and severe disabilities. In this study, mentorship was defined as matching participants with an individual in an occupation with hopes of growing work-based knowledge.

Outcomes and study findings

The articles we reviewed reported a wide variety of outcome measures (mostly non-standardized) used to assess self-determination and self-efficacy [25,42,44,53], psychological well-being and quality of life [52], employment outcomes [52], employment-related skills (interviewing) [49], knowledge of transition to employment [43,50], and social skills and peer relations [25,46] among participants (Supplemental Table 4). A secondary outcome included knowledge about disability (large effect) [25]. Many of the articles did not report effect sizes.

Seven articles reported significant improvements in self-determination (large effect) [42], empowerment (medium effect) [42], self-efficacy (large effect) [25], or self-confidence or self-advocacy [21,25,42,44,53–55] following peer mentor intervention. Articles also reported significant improvements in decision-making, problem-solving [21,53], self-regulation [53], social skills [44], and perceived independence [44,52] (effect sizes not reported). Four articles reported significant improvements in knowledge of transition to employment (medium effect) [43,50], educational planning (medium effect) [41,42], preparedness for college and employment [41,44,52], transition related goals and planning (small effect) [42], or perceived career options [44].

Several significant secondary outcomes were also reported, including improvements in independence [42,44,52], parental confidence in the capabilities of their children, and parental knowledge of strategies to promote independence [21]. Two articles reported improvements in social skills [41,44] and one specifically on improving empathy among youth with autism [46]. One article [52] found improved community participation among youth who took part in a peer mentorship

intervention, while another reported improvements in Internet and computer skills [44].

The articles reported no significant differences in job interviewing skills or performance on job interviews [49], or expectations for working in competitive employment [50]. Grenwolge [55] found no significant differences between type of disability or gender and program outcomes. Finally, there were no significant differences reported in peer relations among youth with autism [46]; or life satisfaction [52]. It is important to note that several articles did not report a statistically evaluated outcome for all of their measures; thus, some of the impacts of the interventions may be under-reported.

Components of interventions

The interventions we reviewed varied greatly in delivery format, length, duration and number of sessions. The number of sessions ranged from one to 130 over a period of two days to two years (Table 3). Seven of the reported interventions were delivered by a mentor with a disability [22,25,44,46,48,49,55], two by peers without a disability [47,51], two by a researcher and parent leaders [43,50], and six by several people—including coaches, rehabilitation providers, and peer mentors [21,53,41,42,45,52]; in the remaining cases, the articles did not specify who delivered the intervention [56]. Six of the interventions were group-based, seven were one-on-one, and four were a combination of both; in two cases, the article did not specify the delivery format. Nine of the interventions were standardized, eight were individualized, and two entailed both standardized and individualized components. Five of the interventions involved practicing skills and/or homework exercises [22,47,49,53], and three involved phone contact with a mentor [25,41,42,52]. Seven of the interventions entailed parent/family involvement in supporting and encouraging the youth [41–43,46,50,53], and one included teacher involvement [49].

Experiences of mentorship

The qualitative studies that we reviewed found that youth experiences of mentorship helped them transition to PSE and/or employment. Youth were exposed to and participated in increased amounts of social activities, and they experienced improvements in their self-confidence, knowledge of their disability, and communication skills [44]. For example, one mentee explained how she felt after her mentorship experience: “I think the greatest impact for me is it helping me to understand more about myself and the people in the real world. I have learned how to adapt to society without thinking that

I am disabled, that I am useless” (44, p. 52). Youth described receiving social and emotional support from their mentors, who had experience with similar situations [28,44]. In the case of one e-mentoring program, mentees found it particularly helpful to ask multiple mentors for advice to get different opinions.

Mentors acted as role models and provided social and emotional support [28,43–45,50], including motivation and encouragement, to youth with disabilities. Mentors helped mentees to navigate services and discussed work experience and pathways to work, such as internships, co-op placements, and volunteer work [57]. Through these mentorship experiences, youth reported gaining improved skills and self-esteem [23,28,43–45,57]. Youth also reported improvements in their social skills [44].

Benefits to mentors

Mentors also reported experiencing benefits from mentoring youth with disabilities. The most common reason mentors reported for wanting to be involved in a mentorship program was to help someone else who, like themselves, had a disability. Mentors suggested that being a mentor helped them to build relationships [23]. Another mentor described additional benefits: “It was a good review of the services available to us. Also, when I saw the freshmen students, I tried to push myself to interact with them since I was a mentor” [23, p. 50]. Building relationships with others who had disabilities was the main benefit and reason mentors decided to take on the role.

Facilitators to implementing mentorship programs for youth with disabilities

The articles described several facilitators for implementing mentorship programs and enhancing the experiences of participating youth with disabilities. Having routine contact between mentors and mentees, either through online or face-to-face meetings, helped to enhance mentees’ experiences of the intervention [44]. Having a structured program with trained mentors, as well as paid staff to provide continued oversight, was another essential enabler reported by several articles [23,28,44,45,57]. Youth believed that they developed social skills through their experiences in mentorship programs. They suggested that the work experience they got through mentorship programs and relationships—such as paid work, co-op placements, internships, or volunteer work—helped to promote skill development among participants [23,28,44,45,57].

Barriers to implementing mentorship programs for youth with disabilities

Several articles highlighted barriers to implementing mentorship programs for youth with disabilities, including limited time with mentors, lack of accommodations or accessibility, lack of available mentors, and difficulties matching mentees with mentors [23,44,45,57]. Further barriers included lack of trained mentors and lack of support for youth in their transitions to PSE and/or employment.

Discussion

Youth with disabilities are an often overlooked and vulnerable population with unique social, educational, and vocational needs. Enhancing their school and employment outcomes is critical, since they experience persistently lower rates of participation in PSE and paid employment compared to their typically developing peers [1,6,11]. Mentorship programs provide a promising approach to reducing barriers to PSE and employment, especially for at-risk populations, such as those with disabilities [17]. This review appraises available evidence on mentorship programs for youth with disabilities, their components, and their effects on school and work outcomes.

Although reported outcome measures and effect sizes varied widely between articles, we found that mentorship programs are possibly effective for influencing positive outcomes related to school and employment. Seven articles reported at least one significant outcome (e.g. self-determination, quality of life, knowledge of school and work supports, social skills, employment outcomes). These findings are consistent with mentorship research conducted among typically developing youth, which has found mentorship provides benefits for job training, educational attainment, social skills, and self-esteem [12–14]; however, in our review, we found less focus on actual job training, work ethic, and practical skills. Studies of mentorship programs among typically developing youth have also found that successful programs are safe, feasible, effective, and acceptable to participants and provide a cost-effective alternative to traditional vocational services [24,58]; however, in our review, we found little mention of safety, acceptability among youth, or cost-effectiveness. Future research on mentorship programs for youth with disabilities should explore these areas further.

One objective of our review was to understand the effective components of mentorship programs aimed at improving school or employment outcomes among youth with disabilities. We found the mentorship

programs that showed significant outcomes were longer in duration (more than six months), which may allow for stronger relationships to develop between mentors and mentees. They were structured and often entailed a planned curriculum and paid program coordinator who trained the mentors and provided continued oversight of the program. These findings are consistent with studies on mentorship programs among typically developing youth, which have found key components of mentorship programs include trained mentors, monitored implementation, structured activities, and parental involvement [17]. Some of the articles in our review described structured activities, but few mentioned parental involvement. Future developers of mentorship interventions should consider incorporating this component.

In our review, we found the contents of effective-mentorship programs were tailored to the program's objectives (i.e. social skills, vocational skills, specific job-tasks), took various aspects of youth's environments (i.e. institutions, community, family) into account, addressed the transition process at various points, and positioned the relationship between mentors and mentee as important for supporting the transition to PSE or employment. Programs that showed significant outcomes were often delivered in group-based or mixed formats, and they were structured rather than individualized. However, further research should be undertaken to compare different formats of mentorship programs and their outcomes.

The types of mentors varied across the interventions we reviewed, according to the goals of the mentorship programs. Mentors included workplace colleagues, adult mentors with similar disabilities (with work experience), and peers with similar disabilities. Mentors acted as role models, offered advice, and provided youth with social and emotional support, including motivation and encouragement. They helped youth to navigate services, supported them in building social and self-advocacy skills, and/or provided advice on work opportunities. Like studies conducted among typically developing youth, the articles we reviewed suggested peer mentors could offer tangible, informational, and emotional support [17,59].

Noted difficulties for implementing mentorship programs for youth with disabilities included lack of mentors, lack of time with mentors, inaccessible programs, or difficulties matching mentors to mentees. These challenges have been similarly reported among mentorship programs for typically developing youth [17]. Indeed, mentorship relationships take time to develop and should involve regular contact over a significant period of time [17].

Future studies should address several areas. First, more rigorously designed and theoretically informed interventions using standardized outcome measures are needed. In particular, there is a need to assess the longer-term school and employment outcomes of mentorship programs for youth with disabilities. Second, further research is needed to compare different lengths, types of programs, and delivery formats of interventions. Third, researchers need to develop a better understanding of what works best (types of outcomes) for whom (type of disability), when (timing of mentorship program), and in what context. Fourth, future studies should explore the cost-effectiveness of mentorship programs. Finally, more in-depth qualitative research is needed to explore the experiences of youth with disabilities who take part in mentorship programs, as well as the experiences of mentors.

Acknowledgements

We would like to thank Dolly Menna-Dack, Carolyn McDougall, Nadia Niles-Campbell and Sara Diederichs for their input on this study.

Declaration of interest

The authors report no declarations of interest. The Ontario Human Capital Research & Innovation Fund funded this study. The first author is supported from a Career Award from the Ontario Ministry of Research & Innovation.

References

- Lindsay S, McDougall C, Sanford R, et al. Exploring employment readiness through mock job interview and role-play exercises: comparing youth with physical disabilities to their typically developing peers. *Disabil Rehabil* 2015;37:1651–63.
- McCloy U, DeClou L. Disability in Ontario: postsecondary education participation rates, student experience and labour market outcomes. Toronto, ON: Higher Education Quality Council of Ontario; 2013.
- Constitution Act, 1982: Part 1: Canadian Charter of Rights and Freedoms [Internet]. Ottawa, ON: Government of Canada; 2015 Feb 19. Available from: <http://laws-lois.justice.gc.ca/eng/const/page-15.html> [last accessed 8 Mar 2015].
- Canadian Human Rights Act (R.S.C., 1985, c. H-6) [Internet]. Ottawa, ON: Government of Canada; 2015 Feb 19. Available from: <http://laws-lois.justice.gc.ca/eng/acts/h-6> [last accessed 8 Mar 2015].
- World Health Organization (WHO). Towards a common language for functioning, disability and health: ICF. Geneva, Switzerland: WHO; 2001.
- Lindsay S. Discrimination and other barriers to employment for teens and young adults with disabilities. *Disabil Rehabil* 2011;33:1340–50.
- Orders S, Duquette C. Enhancing access to post-secondary education in Canada: an exploration of early intervention initiatives in selected countries. Ottawa, ON: Canadian Policy Research Network; 2010.
- Allen J. The road to inclusion: integrating people with disabilities into the workplace: white paper: summary of Deloitte's dialogue on diversity roundtables. Ottawa, ON: Deloitte & Touche LLP; 2010.
- Newsroom: Ontario to increase accessibility, boost economy: province appoints new Accessibility Council [Internet]. Toronto, ON: Queen's Printer for Ontario; 2013 Jul 5. Available from: <http://news.ontario.ca/medt/en/2013/07/ontario-to-increase-accessibility-boost-economy.html> [last accessed 8 Mar 2015].
- Human Resources and Skills Development Canada (HRSDC). Advancing the inclusion of people with disabilities. Gatineau, QC: HRSDC; 2009.
- Lindsay S, McDougall C, Menna-Dack D, et al. An ecological approach to understanding barriers to employment for youth with disabilities compared to their typically developing peers: views of youth, employers and job counselors. *Disabil Rehabil* 2015;37:701–11.
- Ontario Ministry of Education. Special Education Update [Internet]. Toronto: Ontario; 2012. Available from: http://www.edu.gov.on.ca/eng/general/elemsec/speced/SpecialEd_Update2012.pdf [last accessed 8 Mar 2015].
- Carnevale A, Rose S, Cheah B. The college payoff: education, occupations, lifetime earnings. Washington: Georgetown University Center on Education and the Workforce; 2011.
- Hango D, de Broucker P. Education-to-labour market pathways of Canadian youth: findings from the youth in transition survey [Internet]. Ottawa, ON: Canadian Policy Research Networks; 2007 Nov 1. Available from: www.cprn.org/doc.cfm?doc=1787&l=en [last accessed 8 Mar 2015].
- Baum S, Ma J. Education pays: the benefits of higher education for individuals and society [Internet]. New York: College Board; 2007 Available from: http://www.collegeboard.com/prod_downloads/about/news_info/trends/ed_pays_2007.pdf [last accessed 8 Mar 2015].
- Cheatham G, Smith S, Elliot W, Freidline T. Family assets, postsecondary education, and students with disabilities: Building on progress and overcoming challenges. *Child Youth Serv Rev* 2013;35:1078–86.
- DuBois D, Holloway B, Valentine J, Cooper H. Effectiveness of mentoring programs for youth: a meta-analytic review. *Am J Community Psychol* 2002;30:157–97.
- Allen T, Eby L. The blackwell handbook of mentoring. Oxford: Oxford University Press; 2007.
- Coombs-Richardson R. Mentoring and constructivism: preparing students with disabilities for careers in science. Charlotte, NC: Annual International Conference of the Association for Education of Teachers in Science; 2002 Jan 10–13; Charlotte, NC.
- Karcher M, Nakkula M, Harris J. Developmental Mentoring Match Characteristics: Correspondence between mentors' and mentees' assessments of relationship quality. *J Prim Prev* 2005;26:93–110.
- Powers L, Sowers J, Stevens T. An exploratory randomized study of the impact of mentoring on the self-efficacy and community-based knowledge of adolescents with severe physical challenges. *J Rehabil* 1995;61:33–41.

22. Westerlund D, Granucci E, Gamache P, Clark H. Effects of peer mentors on work-related performance of adolescents with behavioral and/or learning disabilities. *J Posit Behav Interv* 2006;8:244–51.
23. Stumbo N, Blegen A, Lindahl-Lewis P. Two mentorship case studies of high school and university students with disabilities: milestones and lessons. *J Rehabil* 2008;74:45–51.
24. Jerson B, D'Urso C, Arnon R, et al. Adolescent transplant recipients as peer mentors: A program to improve self-management and health-related quality of life. *Pediatr Transplant* 2013;17:612–20.
25. Bell C. Mentoring Transition-Age Youth with Blindness. *J Spec Educ* 2012;46:170–9.
26. Sabbatino E, Macrine S. Start on success: a model transition program for high school students with disabilities. *Prev Sch Fail* 2007;52:37–41.
27. Jones M, Goble Z. Creating effective mentoring partnerships for students with intellectual disabilities on campus. *J Policy Pract Intellect Disabil* 2012;9:270–8.
28. Leake D, Burgstahler S, Izzo M. Promoting transition success for culturally and linguistically diverse students with disabilities: the value of mentoring. *Creat Educ* 2011;2:121–9.
29. Fruith V, Wray-Lake L. The role of mentor type and timing in predicting educational attainment. *J Youth Adolesc* 2013;42:1459–72.
30. Lindsay S, Robinson S, McDougall C, et al. Employers' perspectives of working with people with disabilities. *Int J Disabil Commun Rehabil* 2012;11.
31. Shaw S, Dukes L. Transition to postsecondary education: a call for evidence-based practice. *Career Dev Transit except Individ* 2013;36:51–7.
32. Ministry of Training, Colleges and Universities (MTCU) Available from: <http://www.tcu.gov.on.ca/eng/about/annualreport/plans/> [last accessed date 8 Sep 2013].
33. Moher D, Liberati A, Tetzlaff J, Altman D, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* 2009;6:e10000097.
34. Liberati A, Altman D, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med* 2009;6:e10000100
35. Petticrew M, Roberts H. *Systematic reviews in the social sciences: a practical guide*. Oxford, UK: Wiley Blackwell; 2005.
36. Saini M, Shlonsky A. *Systematic synthesis of qualitative research*. Oxford, United Kingdom: University of Oxford Press; 2012.
37. Edlund W, Gronseth G, So Y, Franklin G. *Clinical practice guideline process manual*. St. Paul, MN: American Academy of Neurology; 2004.
38. Blobaum P. *Physiotherapy evidence database (PEDro)*. *J Med Libr Assoc* 2006;94:477–8.
39. Vandembroucke J, von Elm E, Altman D, et al. for the STROBE initiative. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. *PLoS Med* 2007;4:e297.
40. Briggs J. *Cochrane Qualitative Research Methods Group* [Internet]. The Cochrane Collaboration; 2006. Available from: <http://www.joannabriggs.edu.au/cqrmg/role.html> [last accessed 8 Mar 2015].
41. Powers L, Turner A, Westwood D, et al. Take charge for the future: a controlled field-test of a model to promote student involvement in transition planning. *Career Dev Transit except Individ* 2001;2:89–104.
42. Powers L, Geenen S, Powers J, et al. My life: Effects of a longitudinal, randomized study of self-determination enhancement on the transition outcomes of youth in foster care and special education. *Child Youth Serv Rev* 2012;34:2179–87.
43. Francis G, Gross J, Turnbull R, Parent-Johnson W. Evaluating the effectiveness of the family employment awareness training in Kansas: a pilot study. *Res Pract Persons Severe Disabil* 2013;38:44–57.
44. Kim-Rupnow W, Burgstahler S. Perceptions of students with disabilities regarding the value of technology-based support activities on postsecondary education and employment. *J Spec Educ Technol* 2004;19:43–56.
45. Burgstahler S, Cronheim D. Supporting peer-peer and mentor-protégé relationships on the internet. *J Res Technol Educ* 2001;34:59–74.
46. Burgstahler S, Crawford L. Managing an e-mentoring community to support students with disabilities: a case study. *Assoc Adv Comput Educ J* 2007;15:97–114.
47. Hillier A, Fish T, Cloppert P, Beversdorf D. Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum. *Focus Autism Other Dev Disabil* 2007;22:107–15.
48. Likins M, Salzberg C, Stowitschek J, et al. Co-worker implemented job training: the use of coincidental training and quality-control checking on the food preparation skills of trainees with mental retardation. *J Appl Behav Anal* 1989;22:381–93.
49. Storey K, Garff J. The cumulative effect of natural support strategies and social skills instruction on the integration of a worker in supported employment. *J Vocat Rehabil* 1997;9:143–52.
50. Bobroff S, Sax C. The effects of peer tutoring interview skills training with transition-age youth with disabilities. *J Vocat Rehabil* 2010;33:143–57.
51. Francis G, Gross J, Turnbull A, Turnbull R. The Family Employment Awareness Training (FEAT): a mixed-method follow-up. *J Vocat Rehabil* 2013b;39:167–81.
52. Maheady L, Sacca M, Harper G. Classwide peer tutoring with mildly handicapped high school students. *Except Child* 1988;55:52–9.
53. Shem K, Medel R, Wright J, et al. Return to work and school: a model mentoring program for youth and young adults with spinal cord injury. *Spinal Cord* 2011;49:544–8.
54. Abery B, Rudrud L, Arndt K, et al. Evaluating a multi-component program for enhancing the self-determination of youth with disabilities. *Interv Sch Clin* 1995;30:170–9.
55. Ahrens K, DuBois D, Lozano P, Richardson L. Naturally acquired mentoring relationships and young adult outcomes among adolescents with learning disabilities. *Learn Disabil Res Pract* 2010;25:207–16.
56. Grenwelge C, Zhang D. The effects of the Texas youth leadership forum summer training on the self-advocacy abilities of high school students with disabilities. *J Disabil Policy Stud* 2013;24:158–69.
57. Shandra C, Hogan D. School-to-work program participation and the post-high school employment of

- young adults with disabilities. *J Vocat Rehabil* 2008;29:117–30.
58. Boeltzig H, Sulewski J, Hasnain R. Career development among young disabled artists. *Disabil Soc* 2009;24:753–69.
59. Block P, Vanner E, Keys C, et al. Project Shake-It-Up: using health promotion, capacity building and a disability studies framework to increase self efficacy. *Disabil Rehabil* 2010;32:741–54.
60. LaGreca A, Bearman K, Moore H. Peer relations of youth with pediatric conditions and health risks: promoting social support and healthy lifestyles. *J Dev Behav Pediatr* 2002;23:271–80.

Supplementary material available online

Supplementary Tables 1–4