

Disclosure and workplace accommodations for people with autism: A systematic review

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Disclosure and workplace accommodations for people with autism: A systematic review

Citation

Lindsay S, Osten V, Rezai M, Bui S. (2021) Disclosure and workplace accommodations for people with autism: A systematic review. *Disability & Rehabilitation* 33(5): 597-610.

Abstract

Purpose: The objective of this systematic review was to describe the prevalence and processes of disability disclosure for persons with autism spectrum disorder.

Methods: Systematic searches of 7 international databases revealed 26 studies meeting our inclusion criteria. We analyzed these studies with respect to participant demographics, methodology, results and quality of the evidence.

Results: Among the 26 studies, 7006 participants (aged 13-75, mean 28.1 years) were represented across seven countries. Our findings showed that rates of disclosure and receiving workplace accommodations varied considerably. Benefits of disclosing in the workplace included greater acceptance and inclusion, receiving accommodations, and increasing awareness about autism. Limitations of disclosing to employers involved experiencing stigma and discrimination. Factors affecting decisions to disclose included age at diagnosis, social demands of the job, and workplace policies. Types of accommodations that were received or desired included adjustments to the job interview process, schedules (i.e., flexibility, working from home), job content or working conditions, environment (i.e., lighting, quiet space); support with communication and social skills; and disability awareness training for their workplace colleagues.

Conclusions: Our findings highlight that disclosing a condition of autism in the workplace and requesting accommodations is complex. More research is needed to explore processes of disclosing and accommodation and how these processes vary by autism sub-type, gender, and industry type.

Keywords: autism, review, disability disclosure, workplace accommodations, discrimination

Introduction

Autism spectrum disorder (ASD) is a developmental condition that is characterized by deficits in social communication and social interaction and by repetitive patterns displayed in behavior or interests (1). It is a spectrum disorder that can range from milder to more severe forms where individuals may need support to function independently (1). People with ASD often encounter significant challenges with employment across their lifespan (2, 3), which are often due to attitudinal barriers and lack of supports and resources.

Research conducted in Western countries shows that people with ASD, especially with the high functioning forms, are at risk for worse employment outcomes (4, 5) than their peers without disabilities. Individuals with ASD are also more likely than neurotypical adults to be

unemployed, underemployed, overqualified and/or overeducated (6, 7). Even when people with ASD are employed, they are often working in precarious employment (e.g., low-pay, no benefits and/or short-term contracts) (8). Current employment outcomes for people with ASD are very concerning given the multifaceted effects of employment status on individual and societal well-being (9).

Research suggests that people with ASD who transition to competitive employment have the potential to increase their sense of agency and overall well-being (3, 6). People with ASD often encounter difficulties with social interactions in the workplace, problem-solving in social situations, and troubles with changing routines, which could cause challenges for supervisors and co-workers who expect adults to function independently at work (10). More often than others, people with ASD might speak formally or use inappropriate volume, tone, or inflections. These are common concerns that are often interpreted by neurotypical co-workers as rude or odd (9). When overwhelmed by conflict or stress at work, adults with ASD may quit without prior notice (3). They also change jobs more frequently than others (11). As a result of such challenges, people with ASD often struggle with finding and retaining employment (12).

Empirical studies have linked difficulties with finding meaningful jobs for people with ASD to their abilities for effective disability disclosure and requests for workplace accommodations (13-16). While disability disclosure has many nuances, it is essential for requesting and receiving workplace accommodations (7). A common challenge that people with disabilities, including ASD, encounter in entering the workforce is deciding whether, when and how to disclose their condition and request workplace accommodations (17, 18). Providing workplace accommodations is important because they can help to improve work participation and productivity while supporting well-being (18, 19). Exploring disclosure and accommodations is important because non-disclosure could lead to unemployment, unsafe working conditions, and affect job performance. Given that ASD is considered a less visible condition, people may encounter different challenges with disclosing compared to those who have a more visible or physical condition (17, 20).

In many cases disclosing a disability does not necessarily require extensive accommodations. For example, the Job Accommodation Services of the Canadian Council on Rehabilitation and Work (21) provides a comprehensive list of accommodations that may be simple, such as giving an individual an extra break and dividing work assignments into smaller steps; however some accommodations might be complex and costly to employers. However, research shows that managers and human resources professionals often lack an understanding of disabilities, especially those that are less visible or invisible and not associated with cognitive impairment (9). Moreover, emphasis on the impairment and social deficits instead of the strengths and expertise of these individuals might result in them not disclosing their condition to avoid stigma and potential discrimination at work (15). In fact, many adults with ASD often prefer to hide their condition by making a careful study of the behavior of neurotypical individuals and then copying their behavior (17). According to Sarrett (15), concealing a disability can have negative psychological effects. It might lead to social isolation, which is already a concern in the workplace for adults with ASD, increased stress, depression, and other health concerns. Disclosure of a condition may be an essential part of increasing positive work outcomes for individuals with ASD (7). Disclosure has the potential to help with acceptance at

work and can pave the way for training supervisors and peers about the needs of employees with ASD (6).

Despite the challenges that people with ASD encounter when gaining employment, research highlights strong evidence of the benefits for employers from hiring people with autism (11, 22-24). For example, people with ASD may perform well in job tasks requiring systematic information processing, a high degree of accuracy in visual perception, precise technical abilities, increased concentration for long periods, and a high tolerance for repetitive tasks (25). Employees with ASD may also have other qualities that are attractive to employers, including trustworthiness, reliability, integrity, attention to detail, and low absenteeism (23). Therefore, there is a pressing need to identify factors influencing the decision of individuals with ASD to disclose their disability and request workplace accommodations (15). The primary goal of this review was to describe the prevalence and processes of disability disclosure for persons with ASD. In addition, we explored factors associated with disability disclosure and workplace accommodations.

Method

The research question guiding this systematic review was: what is the prevalence of disability disclosure for persons with ASD and what are the processes for disclosing?

Search strategy. We developed our search strategy in consultation with a hospital librarian who has expertise in disability. We searched the following international databases: Embase, Ovid Medline, Healthstar, PsycINFO, ERIC, JSTOR and Sociological abstracts, which were relevant to this topic (i.e., disability disclosure and/or accommodations). Our search strategy included the following keywords and MeSH terms: autism, autistic disorder, neurodiverse, pervasive development disorder, Asperger's syndrome; employment (i.e., work, hire, interview, job application, vocational rehabilitation); and disclosure (i.e., self-disclosure, disclose, conceal, stigma, employer attitudes, non-disclosure) and accommodations (i.e., work adjustment, adaptation, workplace obstacles) (see supplemental table 1). We made minor adjustments to adapt the search within individual databases as needed. We also searched the reference lists of included articles.

Article selection and data abstraction. Our inclusion criteria involved the following: a sample of participants with autism; published in a peer-reviewed journal in English or French from 1998 to October 2018; an empirical article with at least one finding focusing on disability-related disclosure in the workplace or entering work (e.g. interviews, applications) and/or workplace accommodations. This date range was chosen because articles prior to this date were likely to be scarce and not as relevant given the relatively recent larger scale hiring practices and inclusion of people with disabilities in the workforce (24). Disability disclosure and work accommodation practices during this time period may have been influenced by concurrent legislative and policy changes including state ratifications of the United Nations Convention on the Rights of Persons with Disabilities (entered into force in May 2008) (26) or the World Health Organization Policy on the Employment of Persons with Disabilities (effective August 2010) (27). We included methodological designs to capture both rates of and factors associated with disability disclosure or workplace accommodations (i.e., quantitative studies), and the individual perspectives of employees or employers describing disability disclosure or workplace accommodation processes (i.e., qualitative studies). Given the anticipated limited research in this area we included all job

roles and industries. We excluded the following articles: non-peer reviewed, opinion, book chapters, theses, reviews, descriptive (i.e., non-empirical), conference abstracts (i.e., less than 2 pages), and articles focusing on sheltered employment. We excluded sheltered workshops because they have been phased out in many states across the US and also within Canada. Further, given that the purpose of sheltered workshops is for people with disabilities they would likely not need to disclose their condition and thus, articles would not be relevant to our search.

The first author and a research assistant conducted the search where 1516 articles were identified (see Figure 1). After removing the duplicates (n=345), two researchers screened the remaining titles and abstracts for relevance (n=1,171). Following this, we had 109 potentially relevant full-text articles the first author and a research assistant screened for inclusion. Three additional articles were retrieved from the reference lists of included studies. Any discrepancies about which articles were to be included were discussed until consensus was reached. Twenty-six articles met our inclusion criteria.

All authors reviewed the articles before extracting the data and summarizing them. The first author, with experience in systematic review methodology, developed the data extraction table and extracted author information, sample characteristics, objectives, methods, key findings and limitations of each study. The second, third and fourth authors each reviewed a sample of the articles to verify the accuracy of the data extraction table. We followed the preferred reporting items for systematic reviews and meta-analysis (i.e., PRISMA statement) (28), a method of transparent reporting for reviews that allows for a systematic and rigorous approach.

Data synthesis. We used a narrative synthesis approach (e.g., describing and integrating the text of the review) to summarize the quantitative and qualitative findings (29) of the studies included in our review. This approach is best suited for reviews involving diverse methodologies and when studies included in a review are not sufficiently similar (i.e., range of study populations and outcome measures) for a meta-analysis to be appropriate. A narrative method involves organizing content within and across studies. We first organized the key findings into categories representing disability disclosure and workplace accommodation. This approach involved examining and summarizing all of the studies included in the review (29). Next, we analyzed the findings within each category and developed sub-categories when needed. Then, we synthesized the findings across all studies while focusing on patterns emerging across the studies, while also highlighting how they varied by sample, methodological design and quality of the studies (29).

Quality appraisal. We applied the Standard Quality Assessment Criteria (30) to each article, which involves a 14-item checklist for quantitative studies and a separate 10-item checklist for qualitative studies. This tool was chosen because it captures a range of study methodologies and helps to assess the risk of bias across studies, while allowing for a common approach to examining the quality of each study (30). The first author read each article and assigned a score for each item along with an overall score for each study (see supplemental tables 1 and 2). Three additional authors independently reviewed a sample of the articles (8 each) and also assigned a score for each study to help indicate the strength of evidence (reported in detail under quality assessment) (30). All authors noted the limitations and potential biases of each study. After reviewing the inter-rater reliability, any discrepancies occurring in rating the quality of the articles were resolved through re-examination of the article until consensus was reached.

Results

Study and participant characteristics. Fourteen studies were conducted in USA, five in Canada, three in Australia, and one each in France, Portugal, Switzerland, and UK. Reported sample sizes in the included 26 studies (6, 8-10, 15, 31-51) ranged from 4 to 6016 and involved a total of 7006 participants ranging in age from 13 to 75 years old (mean age 28 years old; 73% male) (see Table 1). The ASD sub-types involved in the studies included Asperger's syndrome and high functioning ASD (17 studies) (6, 9, 10, 15, 31-34, 38-40, 42, 43, 46, 47, 49, 52), severe ASD (2 studies) (35, 41), and pervasive development disorder not otherwise specified (7 studies) (36, 37, 44, 45, 48, 51, 53).

Table 1 here

The following standardized measures were used to evaluate disclosure and accommodations: social responsiveness scale, multi-dimensional anxiety scale, autism social skills profile, effort reward imbalance scale, Peabody picture vocabulary test, employer self-efficacy scale, attitudes towards workers with disabilities, adaptation to disability, and organizational autism policy index (see Table 1). Non-standardized measures involved workplace accommodations received, disclosure, social job demands, interest from employers, tasks, capacity to meet vocational needs, degree of autonomy, transformational leadership, degree of socialization, exclusion, employment experiences, support, and expectations.

Of the 30% of studies (8/26) incorporating a theoretical framework they involved: stigma (54), social cognitive theory (55), theory of mind (56), Ricouer's conception of historical time (57), transformational leadership (58), effort reward imbalance model (59), labour process (60), ecosystems approach (61) (see Table 1). The methodological designs varied across the studies and involved the following: randomized controlled trial, multiple-probe experimental design, case study, surveys, interviews, focus groups, participant observations, simulations, discourse analysis, Q-methodology, and mixed methods.

Next, we provide an overview of the key findings regarding disability disclosure and workplace accommodations then outline the common themes and patterns across studies. Finally, we describe the methodological quality of the studies included within our review and its impact on our findings.

Disclosure

Studies within this review reported findings related to disability disclosure including rates of disclosure, benefits, limitations, and factors affecting disclosure (see table 1).

Rates. Only 15% of studies (4/26) in this review explored rates of workplace disclosure. Reported rates of disability disclosure among persons with ASD ranged between (25% to 69%) (see Table 1). Although many of the studies had small samples (i.e., 6–10 participants), one of them reported that 50% of their sample (3/6) did not disclose their condition (40, 42). One of these studies involved various occupations (mean age 36.8) (40) and the other focused on software engineering workers (mean age 41.9) (42). Parr et al. (47) found that among workers with mild ASD who were employed as human service workers, research support staff or cleaning staff, 59% of them (31/52) had self-disclosed their condition to their employer. Meanwhile, in Bublitz et al.'s study, 25% (4/16) of college students with ASD (mean age 22.8) disclosed

aspects of their disability prior to an interviewer asking them to disclose something personal, while 69% (11/16) fully disclosed to the interviewer, and 19% (3/16) did not disclose at all (33). Reasons for non-disclosure included concerns about being judged and experiencing stigma or discrimination (42).

Benefits. Few studies (11.5%, 3/26) focused on the benefits or positive aspects of disclosing ASD in the workplace (see Table 1). Of those that did, they described some of the advantages of disclosing included greater acceptance in the workplace and workplace accommodations (44, 45). In Sarrett's study they discovered some participants focused on the positive implications of disclosing which included increasing awareness and advocacy about ASD (15). Another benefit of disclosing, reported in Nicholas et al.'s study, showed that the depth of self-disclosure in the workplace could help contribute to friendship formation (44).

Limitations. Twenty-seven percent of studies (7/26) reported on limitations of disability disclosure which focused mainly on stigma and discrimination (42). For example, in Nicholas et al.'s study (45), participants with ASD (mean age 22.4) reported the limitations of disclosing included stigma and discrimination (see Table 1). Richards (49) similarly described situations of stigma and discrimination during the job application and interview stages for people with Asperger's syndrome. Indeed other's attitudes towards someone with a disability are often impacted by their disclosure or non-disclosure of their diagnosis (48).

Ameri et al. (31) explored potential workplace discrimination against people with disabilities including Asperger's syndrome, through a field experiment that sent job applications to positions where having a disability was unlikely to affect their productivity. Applicants disclosing a disability (i.e., ASD) received 26% fewer expressions of employer interest (31) compared to those who did not disclose. In another example, (33) explored challenges with verbal communication during employment interviews among college students with ASD. Although most participants fully disclosed their disability, they did not share their strengths or how they would overcome potential challenges, which could affect their chances of getting hired. Another limitation of disclosing involved being or feeling excluded in the workplace (15, 49).

Factors affecting disclosure. Fifteen percent (4/26) of the studies described factors affecting disclosure among those with ASD (see Table 1). For example, Johnson and Joshi (38) explored stigma associated with ASD in the workplace and found that age of diagnosis, social demands, and organizational support policies affected workplace responses. They discovered that those who were diagnosed at an earlier age had greater self-esteem and lower perceived discrimination when they disclosed their disability compared to those diagnosed at a later age (38). Other factors affecting disclosure included work-related identity management (i.e., disclosing or not disclosing), the importance of the social demands imposed by the job, and organizational support policies for people with ASD (38). Those with ASD who were employed were more likely to work in organizations with an explicit policy or support for individuals with ASD (38).

Further, Gattegno et al. (35), found that among their sample of adults with ASD, disclosure occurred during the recruitment process. Permission was given to employment program workers to disclose their condition to potential employers who were willing to hire people with ASD (35). Meanwhile, (46) noted how participants with Asperger's syndrome and high functioning ASD (mean age 38, various fields) who disclosed their condition to their employer were more than three times as likely to be employed than those who did not disclose.

Other factors affecting decisions to disclose were highlighted in Davidson and Henderson's (34) work who found that disclosure among people with ASD involved the following: keeping safe (i.e., protective strategies in disclosure); qualified deception (i.e., complexities of disclosure); like resistance (i.e., tendency to position themselves as other marginalized groups) and education (i.e., building a community to disclose).

Workplace accommodations

Studies within this review conveyed findings on workplace accommodations including rates, types of accommodations, and processes for requesting them.

Rates of requesting and receiving accommodations. Only 15% of studies (4/26) explored rates of requesting and/or receiving workplace accommodations for people with ASD. The rates of requesting accommodations ranged from 50% of study participants (5/10) to 85.7% of study participants (12/14) (37, 42). The study with the lowest rate of requesting or receiving accommodations, focused on people with ASD in a software engineering company (mean age 41.9) (42) (see Table 1). Meanwhile, the study reporting the highest rates of receiving workplace accommodations focused on young adults (mean age 28.4) in various entry level positions (37). Baldwin et al. (32) similarly explored the employment activities and experiences of adults with Asperger's syndrome and high functioning ASD in Australia and found that 72% of participants (94/130) were not receiving workplace accommodations or supports across various job types. In Ohl et al.'s (46) study, they discovered that the majority of participants (Asperger's syndrome and high functioning ASD; mean age 38) who were employed did not receive any job assistance, which could have been due to the high non-disclosure rates. Another study concurred that the majority of participants in their study, 66% (86/130) wanted to receive more ASD-specific workplace supports (32).

Types of workplace accommodations. Forty-six percent of studies (12/26) reported on types of workplace accommodations that were received or desired (see Table 1). For example, at the job application phase, participants with ASD in Sarrett's (15) study described how they wanted adjustments in the job interview and suggested having an online or written format as an alternative so employers could focus on their skills and not performance in an interview. In Hagner and Cooney's (37) study they examined common accommodation strategies provided by someone supervising an employee with ASD (mean age 28.4) in various entry level positions which included: maintaining a consistent schedule and responsibilities, using organizers to structure the job, reducing unstructured time, using direct communication, and providing reminders and assurances. Hedley et al.'s (53) study focusing on young adults (mean age 23.9) with ASD transitioning into work within a tech company, highlighted the importance of providing environmental modifications.

Among older age groups, Morris et al. (42) found that some participants (mean age 41.9) in a software engineering company desired accommodations for business travel (i.e., private room rather than sharing) recording meetings to help them remember work assignments, flexibility to work from home or to have quiet office space rather than working in an open-plan. Further, employees with ASD desired greater disability awareness and sensitivity from colleagues regarding the needs of diverse co-workers (42) and felt this should be a type of accommodation. Others described that having supportive co-workers was an important

accommodation that was desired for peer relationship building, mutual learning and social skill development (44).

Other common workplace accommodations that were provided for those with Asperger's syndrome or high functioning ASD (mean age 35.6), included modifications to job content and working conditions (e.g., flexible hours, special lighting, exemption from customer-facing situations and tailored supervision strategies such as written instructions) (32). Pfeiffer et al. (48) likewise reported that adults with ASD had multiple sensory and physical environmental factors impacting their work satisfaction and performance (e.g., florescent lighting, temperature, noise, visual distractions). Many employees with ASD preferred a small, quiet work area and/or using noise cancelling headphones, while also having a consistent routine and flexible schedule (48).

Some accommodations that were provided included on-the-job training, especially to enhance social and communication skills. For example, Nicholas et al. (44) discovered that youth with ASD valued receiving such accommodations as onsite learning addressing core employment skills such as social communication. Further, involving co-workers in the training helped to build peer relationships and social skill development (44). The training helped employers and co-workers to dispel some of the myths and stereotypes about people with ASD. Further, Kellems et al. (39) explored how video modeling through iPods were used for work tasks for young adults with ASD. They found this form of workplace accommodation was associated with immediate and substantial gains in the percentage of work steps completed correctly (39). Similarly, Lattimore and Parsons (41) explored a form of accommodation that involved enhancing job-site training for workers with autism, where a simulation resulted in a higher level of skill acquisition than job-site only training. Meanwhile, McKnight-Lizotte (9) found that among college graduates with ASD, they wanted accommodations with negotiating co-worker interactions, handling customer inter-communication and communication-oriented coping strategies (9).

Other forms of accommodations that were provided to enhance communication skills were seen in Muller et al.'s study (62), who evaluated the impact of communication stories using their personal iDevice on participants. (43) found that after viewing others' stories, persons with ASD were able to share their personal stories and had strengthened self-esteem and relationships with their supervisors. In addition, the communication behaviours of workplace supervisors were improved.

Finally, although not a common accommodation strategy (36), explored the use of assistive dogs in integrated employment settings using a pre-post intervention design and found no significant differences between experimental and control groups; however, participants (i.e., youth with ASD) did show more self-assurance and openness towards others (36).

Factors affecting accommodations. Nineteen percent of studies (5/26) reported on factors affecting workplace accommodations (see Table 1), which focused mainly on supports. For example, Senechal et al.'s (63) reported that it was important to provide support during the recruitment process and therefore, accommodations included fitting employment to each individual's skills. Employees with ASD had a specific process for addressing any concerns they had with their accommodations. This included discussing with a program advisor, who then explored further areas of support (63). However, they noted that the quality of the accommodations provided was questionable because 60% of the sample (6/10) mentioned that

assigned co-workers who were supposed to provide support were not present as often as they had expected (63). Furthermore, Nicholas et al. (45) examined employment support resources for people with ASD and found the quality and beneficial impact of employment support services for adults with ASD may be perceived more favorably by employment personnel than by individuals with ASD.

In Scott et al.'s (6) study, employers reported feeling more confident about employing individuals with ASD when they received ongoing, external support from disability employment service providers. Others mentioned that they needed to provide support from within their team such as on-the-job training, explaining workplace culture, and encouraging effective communication skills. In a similar study, Scott et al. (52) evaluated the effectiveness of an integrated employment success tool for improving employers' self-efficacy in modifying the workplace for people with ASD. They found no significant differences between the groups in relation to self-efficacy in implementing autism-specific workplace modifications and employer attitudes towards disability in the workplace (52). Meanwhile, Hedley et al. (53) noted that factors and supports that helped young adults (mean age 23.9) with ASD to find employment within a tech company were organizational support, advice from co-workers, supportive leadership, and environmental modifications.

Quality assessment and risk of bias within studies

Limitations within each of the studies in this review are noted in Table 1. At least 2 authors independently rated the quality of each study using the standard quality assessment tool (30). Total scores for the 18 quantitative studies ranged from 29 to 82% (mean 64.4%) (see supplemental Table 2) and 35 to 85% for the 12 qualitative studies (mean 66.2%) (see supplemental Table 3) with an inter-rater agreement of 90%. For the remaining studies that did not have inter-rater agreement, discrepancies in the overall scores ranged from 0.05 to 0.30. Most discrepancies reflected the extent of how applicable each item was. These articles were re-read and discussed until we reached consensus regarding the score. We considered a score to have a low quality if it had a total overall score of less than 70%. Good quality studies included scores ranging from 70-79% and stronger quality scores were 80% and above.

We explored the risk of bias within each study and overall quality. Areas of the quality assessment where quantitative studies had low scores included: measurement (e.g., misclassification bias), methods of analysis (e.g., lack of consideration of confounding variables) and reporting (e.g., failure to describe the variance of main results). Meanwhile, areas of quality assessment where qualitative studies had low scores included: verification procedures to establish credibility (e.g., limited triangulation or member checks), reflexivity (e.g., impact of personal biases), and sampling methods.

Limitations and risk of bias within our review

We explored the risk of bias across studies within our review. First, we only included articles in English or French and therefore the findings and recommendations may not be generalizable to other (non-English or French-speaking) countries. Second, given the wide age range and various ASD sub-types that were included in the studies, the findings should be interpreted with caution. Third, the studies in our review were from seven different countries, all of which have different practices and policies for disability disclosure and workplace accommodations which may have

impacted both the rates of disclosure and individual experiences. Fourth, the studies focused on various perspectives and not all from the employee perspective.

Discussion

Our reviews explored how people with ASD disclose their disability, request and receive workplace accommodations, over a 20-year period. Exploring this topic is important because people with ASD often struggle with how to disclose their condition, which is necessary to receiving workplace accommodations. Having accommodations are critical because they can help to enhance quality of life and work productivity (17, 18). As such, it is salient to explore how people with ASD disclose their condition and request accommodations in the workplace so we can help to enhance healthy and productive work. Although there is increased attention to workplace disclosure and accommodations for people with disabilities, it has not yet been synthesized for those with ASD, who arguably experience different challenges than those with more physical and/or visible conditions.

The findings of this review highlight that few studies reported on rates of disability disclosure. Of those that did, they varied considerably from 25-69%. We noticed that disclosure rates varied by the age of the sample, which could be due to inter-generational differences or cohort effects in comfort level with disclosing (64). Such variations could also be a result of an increased awareness and understanding of the abilities of persons with ASD, differences in the type of job, size of company, industry type and employer's experience with disability (65). We need further research to explore these possible explanations. For example, people with a disability who work for an employer who purposively hires people with disabilities, including ASD, may be more comfortable disclosing their condition than those who work in a company with fewer employees with disabilities (65). More supports may be needed for employers to help provide employees with accommodations.

Our review also highlighted some benefits of disclosing an ASD diagnosis including receiving accommodations, greater acceptance in the workplace, increasing awareness and advocacy about ASD. These findings are consistent with other research on disclosure of other types of disabilities where they reported that benefits to disclosing can create an atmosphere of acceptance by enhancing employer's understanding of their need for accommodations and enhanced social integration (14, 66, 67). Others note that disclosing a disability in the workplace has the potential to increase overall company moral and retention of employees (68). Within the studies in this review, much less attention was paid to the benefits and instead, on the limitations of doing so. Clinicians and vocational counsellors should support people with autism to advocate for their needs in the workplace, including the potential benefits of disclosing their conditions so they can access accommodations.

Many studies in this review focused on the limitations of disclosing, which included stigma and discrimination. These findings are consistent with other research highlighting that fear of experiencing negative attitudes was a common reason for non-disclosure (16, 69, 70). Disability-related discrimination, including experiences in the workplace, often results from a lack of knowledge and experience in working with people who have a disability (65). Lacking knowledge and experience with people who have a disability can cause discomfort, distancing or exclusionary behaviours and often discriminatory attitudes towards them (65, 71). Other research also shows that people who have a hidden or less visible condition such as ASD, may be more

reluctant to disclose as a result of their fear of encountering discrimination (65, 72). Employers should recognize that people with ASD may be reluctant to disclose their condition and should make efforts to create an inclusive environment and help them feel comfortable with disclosing their condition.

Factors affecting disclosure included age at diagnosis, demands of the work, and organizational policies. Our review showed that rates of receiving workplace accommodations varied considerably, which could be a result of the different age groups and/or job types. For example, other research shows how the type of employment and industry sector including work expectations and working conditions could influence decisions to disclose (17, 69, 73). Research shows that companies that are committed to having a diverse workforce often have more disability-related policies and practices (74).

Our review highlighted the various types of workplace accommodations including: adjustments to the interview process, work schedule and responsibilities, support with communication and social skills, and physical environment (e.g., lighting, noise etc.). These accommodations differ somewhat with previous research on people with other types of disabilities (i.e., more physical disabilities) where common accommodations often address physical workplace and access (17). Clinicians and employers should recognize that people with ASD may have different workplace accommodations needs (e.g., social and communication skills, environmental supports) than those with other types of disabilities.

Regarding factors affecting requests for workplace accommodations, our review showed that it depends on support and knowledge of co-workers and employers. These findings are consistent with other research showing that supportive workplaces that provide accommodations to people with disabilities, have employees that are less likely to leave (75). Meanwhile, employers who lack experience in working with people who have a disability often express concerns about the potential costs of providing accommodations (76). Other research (77) shows a need for further training and awareness about employee rights and access to supports. They encountered negative attitudes and stigma that impeded their experience (77) and many employers lack experience in working with people who have a disability (65). It is also important to note that disclosure of a condition varies by cultural and workplace context (18, 78) and may encounter different challenges, which are worthy of further exploration. Employers should ensure that they have the appropriate training to include people with disabilities in their company.

Future directions. There are several directions that future studies should consider. First, more methodologically rigorous research is needed to understand how disclosure and accommodation requests vary by ASD sub-type and other socio-demographic factors such as gender, age and culture. Second, more work should explore how individuals' with ASD families, education level, job type, employment type (e.g., full, part-time, contract) and industry sector and size of organizations influence disability disclosure and types of accommodations that are provided. Third, there is a need for more focus on workplace experiences once people have been in the workplace for some time because most research focuses on gaining employment and the first experiences in the job. Fourth, more work is needed to understand the process of disability disclosure and how accommodations are requested and received and the impact of prevailing social and workplace policies. Finally, researchers should consider exploring whether and to what extent social and communication skills and the creation of inclusive workplace environments (including disability awareness and anti-stigma training for co-workers) should be workplace accommodations. For example, shifting focus away from expectations of individuals with ASD to change and instead focus on changing the environment to be more inclusive of people with all abilities.

Conclusion

Our review highlights the literature on disability disclosure and workplace accommodations for people with autism. Our findings showed that rates of disclosure and receiving workplace accommodations varied considerably. Benefits of disclosing in the workplace included greater acceptance/inclusion, receiving accommodations, increasing awareness about ASD. Limitations of disclosing to employers involved experiencing stigma and discrimination. Factors affecting decisions to disclose included age at diagnosis, social demands of the job, and workplace policies. Types of accommodations that were received or desired included adjustments to the job interview process, schedules (i.e., flexibility, working from home), job content or working conditions, environment (i.e., lighting, quiet space); support with communication and social skills; and disability awareness training for their workplace colleagues. Our findings highlight that disclosing an ASD condition in the workplace and requesting accommodations is complex. There is a critical need for further studies to explore the processes around disclosing disability and requesting workplace accommodations.

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Table 1. Overview of Studies

Authors, (country)	Sample characteristics	Objective	Design (measures; theory)	Key Findings*	Limitations and future research
Quantitative studies					
Ameri et al. (31) (US)	6016 (1/3 Asperger's syndrome) -100% male -mean age n/a -accounting positions (college or certified accountant)	To investigate potential discrimination against people with disabilities in the job application stage	Evaluation (expressions of interest from employers) -theory n/a	-The job applications that disclosed their disability in the application received 26% fewer expressions of interest from the employer -Employers with less than 15 employees are less likely than larger-scale employers to express interest in applicants with disabilities	-Focused on perceived discrimination rather than actual behaviour -Only male applicants and focused on accounting positions
Baldwin et al. (32) (US)	130 adults with Asperger's syndrome and high functioning ASD (68% male; mean age 35.6) -Various jobs (clerical, laborer, professional, technician/trades; (86% had a post-	To describe the employment activities and experiences of adults with ASD in Australia	Survey (% receiving workplace accommodations) (theory: n/a)	-72% of participants were not receiving workplace accommodations -Of those who received adjustments they included modifications to job content and working conditions (flexible hours, special lighting, exemption from	-Participants may have been self-diagnosed -Did not specify what accommodations were needed in different job types

	high school qualification)			customer-facing tasks and tailored supervision strategies) -66% wanted more ASD-related support	
Bublitz et al. (33) (US)	16 college students with ASD (76% male, aged 17-38, mean 22.8) -14 without disability (aged 18-26; mean 20.7; 85% male) -various job types	To identify challenges with verbal communication during employment interviews	Mock employment interviews (social responsiveness scale; work history; degree of socialization; theory of mind)	-Most disclosed their disability but rarely shared their strengths -Students with ASD had slower responses and greater variability in response length; had less desire for social aspects of employment	-Comparison group was inadequately matched by age, gender and job type -Did not specify the type / level of ASD -Did not assess non-verbal behaviours -assessed
Gattegno et al. (35) (France)	6 adults with ASD (5 with severe, 1 high-functioning ASD) (67% male; mean age 32.2); jobs: warehouse / factory (3), library (2), government (1)	To evaluate the degree of autonomy in work-related and non-work-related tasks	Observational coding (Category of tasks; ADL, degree of autonomy; theory: n/a)	-Disclosure occurred in the recruitment process of employers from the psychologist to partake in a life skills program for adults with ASD	-Small sample size -Internal validity; one rater per person
Groomes et al. (36) (US)	14 youth with ASD (sub-type not specified) (85% male; mean age 13) -Job/industry type n/a	To explore the use of assistive dogs in integrated employment settings	Pre-post intervention (multi-dimensional anxiety scale for children; adaptation to	-No significant differences between experimental and control group -Participants showed more self-assurance	-Small sample size -Uneven gender distribution -Young age group (not typically employed)

			disability scale-revised; autism social skills profile; theory: n/a)	and openness towards others -Human-animal interaction could help integrate youth into the workforce	
Kellems & Morningstar (39) (US)	-4 (100% male; mean age 21.5; (2 ASD; 2 Asperger's syndrome) -various entry level jobs: maintenance workers and vending machine operator)	To evaluate the effectiveness of using video modeling delivered through a portable media player (Apple video iPod) as a means of teaching job-related tasks	Participant observations; (independent steps completed correctly; theory: n/a)	-Using the iPod was associated with immediate and substantial gains in the % of steps completed correctly -All of the participants demonstrated maintenance of the acquired tasks	-Lack of female representation -It is unknown how much the verbal instructions or prompts they had on task
Lattimore et al. (41) (US)	-4 (100% males; mean age 32.8) with severe autism -industry: small publishing company (clerical and cleaning)	-To compare the effects of job-site training supplemented with simulation training to the effects of job-site training alone on the acquisition of new job skills among supported	-Multiple probe experimental design (simulation training) (% task steps performed independently; theory: n/a)	-Across 3/4 applications of the two training approaches, the supported worker who received job-site plus simulation training made progress and met the performance criterion more quickly than the worker who received training only while on the job -Job site training is more effective if	-No control group; no statistical measures for differences in effects or variance

		workers with autism		supplemented with simulation training	
Ohl et al. (46) (US)	354 adults with AS; high functioning ASD (55% male; mean age 38; 84% had comorbidities; 86% Caucasian, 75% single and 65% with university degree) -Held jobs in 35 different fields, top six fields included: IT (10.4%), education and teaching (9.7%), retail (9.1%), healthcare (8.4%), food services (5.8%), government (4.6%)	To examine the employment characteristics and histories of both employed and unemployed adults with ASD and the factors contributing to employment status.	Survey (effort reward imbalance scale); theory: effort-reward imbalance model	Adults with ASD were 3 times more likely to be employed if they disclosed their disability	Relied on self-reporting ASD and is not nationally representative -Sample consisted of predominantly Caucasians and post-secondary educated
Parr et al. (47) (US)	52 employees with mild ASD (48% male; mean age not reported); -Job type consists of service workers, research	To test the hypothesis that emotion-laden communication and social exchanges are associated with	Questionnaires and interviews (transformational leadership, anxiety and organizational commitment)	-Levels of anxiety in employees with ASD decrease the more a supervisor is willing to accommodate their needs.	-Self-reported ratings, focused on one leadership theory, -Does not include a comparison sample

	support staff, or cleaning and support staff	increases scores in anxiety in turn, negatively relate to work outcomes.	and performance); theory: transformational leadership)	-59% of the sample disclosed their condition to the employer	-Majority of participants had a mild form of ASD.
Scott et al. (6) (Australia)	40 (60% male; mean age 29.1; Asperger's syndrome and high functioning ASD) and 35 employers -Job/industry type: n/a	To explore the key factors for successful employment from the viewpoints of adults with ASD and employers.	Q-method (employment process, support, expectations; theory: n/a)	-Inclusion and employer support are important facilitators of work participation -Employers often lack confidence in implementing accommodations -Significant differences between employers and people with ASD regarding the type of workplace support; job and productivity requirements expectations that continue to hinder successful employment	-Not all aspects related to work were included (e.g., workplace bullying, anxiety, disclosure) -Did not specify the job or industry type
Scott et al. (52) (Australia)	84 employers of people with ASD (52% male; aged 21-45; mean age n/a; Asperger's syndrome, high-functioning)	To evaluate the effectiveness of an autism-specific workplace tool in improving	Two armed randomized control trial; intervention (workplace manual for hiring people	-Disclosure occurred in the employment program when recruiting employers and during the interview process.	-Potential sampling bias -Small sample size -Researchers unable to recruit diverse sample -Positive experiences with people with ASD

	Jobs: manufacturing, healthcare, social assistance, financial and insurance	employers self-efficacy.	with ASD) (Employer self-efficacy and attitudes towards workers with disabilities); social-cognitive theory	-Increased employer self-efficacy in providing accommodations at all stages of employment for people with ASD though did not improve attitudes towards those with ASD in the workplace	may have contributed to employers participating in the study.
Mixed methods					
Muller et al. (62) (US)	9 (66% male; mean age 21.4; ASD) six males 3 females) 2 ASD participants; 5 with ID, one with ID/ASD and one with ID and other health problems. aged 18-22 -Various job/industry types	To evaluate the perceived impact of Communication Stories on participants, their job coaches, and workplace supervisors.	Mixed method (theory: n/a)	-Significant increase in knowledge of participants communication strategies and confidence -Participants strengthened their self-esteem and relationship with employers -Viewing stories had a positive impact on job coaches and supervisors	-Small sample size -Might be based on supervisors and job coaches estimation of communications -Participants were unpaid interns -No control groups
Nicholas et al. (45) (Canada)	137 clinicians, 71 individuals with ASD (59% AS, 15% PDD, 26% unspecified severity level autism; 69%	To understand employment service providers capacity to offer service to adults with	Mixed methods survey and interviews (capacity to meet vocational	Disclosing ASD had limitations and benefits; disclosure in job interviews resulted in not being hired or providing understanding and	-Convenience sampling; -Under-representing groups such as women with ASD, rural and remote participants)

	male; aged 18-65; mean age n/a; -Job/industry type not reported	ASD and to determine the quality adults with ASD and caregivers believe they are receiving in employment programs	needs, enhancing broader systems capacity) and semi-structured interviews; theory: n/a)	acceptance from employer for providing accommodations	-Survey was limited to relative existing community services and not nationwide employment program efforts.
Sarrett (15) (US)	87 (49% male; aged 18–55 years; 47% ASD, 27% Asperger’s syndrome, 13% self-diagnosed, 3% PDD-NOS, 10% other) -Jobs: retail, internship, non-profit, administration	To explore challenging experiences of adults with ASD in the workplaces	Survey and focus groups (employment experiences; theory: stigma (Goffman)	-Challenges in feeling comfortable with disclosing at work; -Fear of stigma prevents access to accommodations	-Race, ethnicity and income were not included -Limited socio-demographic details -Some participants were self-diagnosed
Qualitative studies					
Davidson & Henderson (34) (Canada)	45 autobiographies of people with ASD (mean age and gender n/a) -Various jobs	To explore 4 discourse clusters that emerge from texts	Discourse analysis to autobiographies of people with ASD Theory: n/a	-4 discourse clusters (themes): keeping safe (protective strategies in disclosure); qualified deception (complexities of disclosure); like/as resistance (tendency to position themselves as marginalized group);	-Did not specify the gender, age or ASD sub-type

				and education (building a community to disclose)	
Hagner & Cooney (37) (US)	14 supervisors of people with ASD (sub-type n/a) (85% male; mean age 28.4) -Various jobs/industries (mainly entry level)	To understand the perspectives of supervisors about employees with ASD	Interviews and observations (theory: n/a)	Common accommodation strategies: maintaining a consistent schedule and responsibilities, using organizers to structure the job, reducing unstructured time, having direct communication, providing reminders and reassurances) -12/14 employees had job modifications	-Small sample size, preliminary findings -ASD sub-type not specified -Inconsistencies in who was interviewed (co-worker, coach etc.) -Included various industries and sizes
Hedley et al. (53) (Australia)	28 (9 adults with ASD (89% male; mean age 23.9); 6 family members, 7 support staff; 6 co-workers) -Tech company	To identify factors associated with successful transition to work from the perspectives of individuals and those that work with them	Focus groups (theory: n/a)	Facilitators (organizational support, advice from co-workers, supportive leadership, allowance of environmental modifications) -Barriers (task-related difficulties, individual factors, social difficulties, distractibility, not managing work- related stress, perceived as too frank)	-Small and heterogeneous sample, gender imbalanced -Did not state the ASD subtypes

Johnson & Joshi (38) (US)	30 adults with high functioning ASD or Asperger's syndrome (gender n/a; aged 24-58; mean age n/a) -212 adults with ASD gender and mean age n/a) -Various jobs	To explore the stigma associated with ASD in the workplace	Interview and survey (disclosure; job social demands; organizational autism policy index; theory: n/a)	-Diagnosis of ASD is a milestone event that triggers both positive and negative responses to work -Age of diagnosis, social demands and organizational support policies affect work responses -Those diagnosed earlier age had greater self-esteem and lower perceived discrimination when they disclosed their disability	-Relied on retrospective perspectives -Did not provide the mean age or gender composition of the sample
Krieger et al. (40) (Switzerland)	-6 adults (67% male; mean age 36.8) with Asperger's syndrome; -various professions (psychologist, professor, accounting, computer scientist, natural practitioner, gardener, legal secretary)	-To gain in-depth knowledge about contextual factors, which contribute to successful labor market participation in some adults with AS	-In depth-interviews; developmental and hermeneutic narrative approach; -Using interpretation theories of Ricoeur's conception of historical time.	-Participants received pre-vocational requisites during their childhood through parents and friends that provided a feeling of security in social contexts -Recognition of participants' capacities for understanding and adapting to social norms -Participants' understanding of their	-Participants self-identified as having AS without official diagnostic criteria -Possible loss of the linguistic richness of a participant's statements (Swiss to German to English) -Narrative approach in this study did not distinguish between going to work, desiring to work, and staying employed.

				own needs was essential to labor market participation -Disclosure is rare and social stigma is still present (3/6 did not disclose)	
McKnight-Lizotte (9) (US)	6 (66% male; mean age 30; Asperger's syndrome) college graduates with ASD who have been employed for one year -Various jobs /industry types	To identify situations where communication was a barrier to employment	Case study and interviews (theory: n/a)	-Communication-related themes: job interview success; negotiating co-worker interactions; handling customer inter-communication; communication-oriented coping strategies	-Small sample size -Various job/industry types
Morris et al. (42) (US)	10 (90% male; mean age 41.9; 4 with ASD, 4 Asperger's syndrome, 1 PDD-NOS, 1ADHD) and -11 (ASD) Software engineering	To understand the challenges that impede employees with ASD from realizing potential in the workplace	Interviews and survey (theory: n/a)	-50% did not disclose due to concerns about being judged and discrimination -Accommodations included extra space for business travel; audio recording meetings; flexible work schedule and greater awareness and sensitivity from colleagues	-Small sample size; diverse age range and ASD sub-types

Muller et al. (43) (US)	18 (72% male; mean age 37.2; 15 Asperger's syndrome or other ASD) 5 females 13 males 9-18 to 32 9-38-62 -various job/industry type	Pilot study to explore consumers perspectives on strategies for improving vocational placement and job retention services for individuals with Asperger's syndrome and other ASDs	Semi-structured interviews (theory: n/a)	-Support like job coaching is needed at all stage of the employment to ensure job retention. -Intensive instructions for individual with ASD to perform complex tasks. -Job matching to eliminate isolating experiences at the workplace -Individualized ASD specific supports	-All participants are from the same geographic area -All were European descent therefore represented an ethnically homogenous group
Nicholas et al. (44) (Canada)	14 participants with ASD (64% male; mean age 22.4) 4 peer mentors (aged 21-24) 10 employers (leisure and hospitality, warehousing, construction and retail)	To provide deeper insight into understanding employment and ASD using an ecosystem, approach in the Employment Works Canada program	Qualitative case study; interview questionnaire (Peabody picture vocabulary test) theory: Ecosystem approach	-Accommodations such as supportive co-workers was viewed as important for collegial/peer relationships building, mutual learning and social skill development	-Small sample size, -Did not substantially include individuals with ASD exhibiting cognitive delay and/or communications impairments, or living in rural/remote areas;
Pfeiffer et al. (48) (US)	-14 adults (42.9% male; mean age 41.1) with high-functioning autism, PD-NOS	-To understand the impact of environmental factors on work	-Qualitative interviews -Grounded theory approach	-Adults with ASD identified that social interactions, attitudes, and the physical or sensory environment	-The study did not consider the perspectives of co-workers and supervisors

	or Asperger's syndrome -Various jobs/industry types	satisfaction and performance		impacted perceptions of work satisfaction and performance the job characteristics	
Richards (49) (UK)	-237 (% male and mean age n/a; Asperger's syndrome) -25 (88% male; aged 21-75; Asperger's syndrome) -job/industry type n/a	-To examine reasons for disproportionately high levels of exclusion from the workplace of adults with Asperger's syndrome	-Empirical analysis of secondary, qualitative datasets; (exclusion; theory: labour process)	-Raising awareness of how management control influences exclusion -Employers are unhelpful towards requests by employees to be represented by third parties on employment-related matters	-Limited information on data sources and methods of analysis -20% of the sample had a self-diagnosis -Did not specify type of jobs or industry -Gender composition of sample not reported
Senechal et al. (63) (Canada)	10 advisors from employment programs for people with ASD mean age n/a); -ASD sub-type and job/industry type were not reported	To evaluate the impact of the program, and to create an inventory of services from employment centers	Interviews; theory: n/a	-Disclosure occurred in the recruitment process of employers from the employment service -Employees with ASD had a specific process for addressing concerns for accommodations	-Restricted study sample representation -Did not include programs in other major employment programs for people with ASD

*This table only reports findings related to our objective

Figure 1—Search process flow diagram

