



Original Research

Enhancing Employment Opportunities for Individuals with Autism Spectrum Disorder: A Comprehensive Meta-Analysis of Factors, Strategies, and Inclusive Practices

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Abstract: The growing number of individuals with autism spectrum disorder (ASD) emphasizes the need for inclusive hiring procedures. This meta-analysis aims to assess the work prospects for people with ASD by determining the factors influencing these results and providing recommendations for enhancing job opportunities. It looks at several questions about employment rates in the community of people with ASD, employment outcomes in comparison with the general population, factors influencing these outcomes, potential differences in employment outcomes depending on the severity of ASD symptoms, and ways to increase employment rates overall. The research methodology includes searching academic databases such as PubMed, PsycINFO, and Scopus for literature; researching peer-reviewed journals with sample descriptions and transparent, clear methodologies (also addressing other variables); evaluating the quality of each study by assigning a score based on scientific rigor and overall quality; extracting and synthesizing data (e.g., employment rates); and conducting statistical analysis. The findings show that a variety of variables, such as a lack of social and communication skills, workplace discrimination, and repetitive behaviors, contribute to the low employment rates among individuals with ASD. A supportive atmosphere that encourages skill development, vocational training, and sensory integration treatment are a few practical interventions that could raise the current rates and results. The study's conclusion notes that, although the analysis's findings are helpful to educators, legislators, and other decision-makers, focused interventions and the promotion of interdisciplinary cooperation are also urgently needed.

Keywords: Employability, Employment Opportunity, Autism, Workplace, Skill Development

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder marked by difficulties with social functioning and social communication, limited interests, and repetitive behaviors (Hodges, Fealko, and Soares 2020). As the prevalence of ASD rises, the need to help people with autism transition into adulthood and integrate into the workforce is becoming increasingly clear (Hendricks 2010). Employment is crucial for quality of life and personal planning as people age. Effective behavioral and social therapies can lead to employment, although individuals with ASD are more likely to experience difficulties at work because of behavioral and social interaction problems (Westbrook et al. 2012). However, comprehensive studies on the wide variations in occupational outcomes for

individuals with ASD are scarce. A meta-analysis of prior research can aid in the creation of interventions and support systems by providing a deeper understanding of the relationship between autism and employment outcomes.

Companies often employ people with ASD due to their unique skills. According to Volkmar and Wiesner (2021), people with ASD can be extremely detail-oriented, favor monotonous or socially isolated professional professions, and approach challenges differently. They tend to be dependable, accurate, efficient, and consistent because of their integrity, honesty, and trustworthiness. This meta-analysis looks at the factors that influence the job outcomes of individuals with ASD. The major goals of this study are to better understand the impacts of ASD in adults and younger adults, employment outcomes for people with ASD, factors influencing their performance in the workplace, issues they face in the workplace, and suggestions for the future to address the obstacles identified. According to an Australian study, employing people with ASD may strengthen the economy of a community. This analysis suggests that cutting the unemployment rate for individuals with ASD in half might increase Australia's GDP by \$43 billion. The Australian government saves over 6 million dollars for every one hundred unemployed people with ASD who participate in the Australian Dandelion Employment Program. These savings come from tax gains, reduced welfare benefits, and lower costs associated with unemployment services (Griffiths et al. 2020).

Even as the number of people with ASD who are working and getting recognized for their abilities grows, many still meet major hurdles and obstacles to finding meaningful work. These challenges include underemployment, unemployment, and unfair low pay. These difficulties underline how important it is to better integrate neurodiverse workers into the workforce. However, multiple issues need to be addressed, such as the dearth of specialized support services, pervasive misconceptions about the skills of individuals with ASD, and discrimination in the workplace (Fong et al. 2021). Achieving equitable employment practices for all and realizing the full potential of these individuals require prioritizing inclusive recruitment strategies, specific job training programs, and reliable support systems. Despite these positives and the increasing recognition of ASD's potential, a significant percentage of individuals still lack a job or are paid little. In this case, meta-analysis addresses pressing concerns: What is the general employment rate for individuals with ASD? How does the employment rate of adults with ASD compare to the overall population? How are employment opportunities for individuals with ASD influenced by age, education, and social support? Do co-occurring disorders or the severity of ASD impact employment outcomes? How can we increase the employment of individuals with ASD? Given that 3.5 million Americans and tens of millions of individuals globally suffer from ASD, it is imperative to better understand the causes of unemployment. According to Griffiths et al. (2020), the US spends over \$236 billion a year on ASD support services. A

thorough evaluation conducted in 2012 by Westbrook et al. found that individualized employment therapies help people with ASD find, acquire, and keep jobs. The goal of these initiatives is to improve the social and career opportunities for individuals with ASD.

People with ASD face obstacles in the workplace and have poorer employment outcomes due to their social, linguistic, and behavioral characteristics. Hendricks (2010) asserts that for them to thrive, services and support must be customized to meet their needs, interests, and abilities. This study is important because, for individuals with ASD, employment enhances their sense of self-worth, financial security, and economic independence (Siperstein, Parker, and Drascher 2013). More thorough research can have a positive impact on individuals, families, companies, and the community, leading to targeted interventions, changes in the law, a more diversified workforce, increased output, and a decrease in the need for social services. This meta-analysis examines the literature on employment status, opportunities, and success variables for individuals with ASD. It offers a solid foundation for future interventions and policy recommendations by calling attention to the problems and opportunities faced by this demographic.

Study Approach

The study strategy is to conduct a thorough review of several groundbreaking research studies to understand the complex nature of work outcomes and the related difficulties faced by individuals with ASD. The meta-analysis assesses the career opportunities for people with ASDs. The goal of the research is to determine which factors—such as age, level of education, social networks, and ASD severity—affect these outcomes. The study carefully examines, using a variety of research methods, the occupation and job patterns among individuals with ASD diagnoses. It thoroughly assesses employment data, looks at the underlying factors affecting job success, and recommends practical steps to enhance outcomes for people with ASD. The project draws attention to the increasing number of individuals with ASD and emphasizes the need for inclusive recruiting and hiring procedures. The issue focuses on the various difficulties that people with ASD face in the workplace including interpersonal, organizational, and social problems.

Literature Review

The challenges faced by autistic people are both social and organizational. Society often labels people with ASD and is indifferent to their skills, consequently leaving them unemployed. Moreover, employers can also struggle to understand the condition or be unwilling to make reasonable accommodations for employees with ASD. On an individual level, other factors such as the degree of ASD, education, and social networks can also affect career opportunities. A crucial step toward better job opportunities for people with autism

is to design learning programs that focus on their specific learning paces and needs. Another significant effort for organizations should be to enhance inclusivity by providing employees with sensory and social training and creating a work environment that accommodates the needs of individuals with ASD. The report highlights the role of accepting neurodiversity and adopting methods that embrace diversity in recruitment.

Analyzing Employment Outcomes for Individuals with ASD

ASD individuals have the ability and desire to work, although most studies indicate that this group's employment prospects are not good (Hendricks 2010). The increasing number of people with ASD and their unique social, communication, and behavioral characteristics have translated into an increase in social demand for socialized career support tailored to their needs. When individual characteristics, such as strengths, requirements, and specific interests, are considered and the appropriate supports are put in place, successful and continued employment can be achieved (Hendricks 2010).

The study by Wehman et al. (2016) looks at sixty-four ASD individuals who received supported employment support services between 2009 and 2014. Over the past few decades, there has been an increase in the prevalence of ASD in children. These children have grown into young people who require competitive integrated employment (CIE). While customized employment (CE) has shown benefits for certain individuals with developmental disabilities, its effects on individuals with ASD are not well studied. Employment specialists utilized methods for retaining employees, including on-the-job training, situational assessment, job growth, discovery, and positive behavioral support.

During this period, all clients receiving vocational rehabilitation services associated with ASD were successful in getting CIE and maintaining their jobs with further support. Using supported employment, the overwhelming majority (63/64, 98.4%) of individuals were able to find CIE in seventy-two different job positions. Of those who did find work, 77 percent had never worked previously, and 18 percent had only worked for short periods. The job seeker oversaw the job search and, in the end, the hiring choice, even though they had no prior work experience (Wehman et al. 2016).

A different study conducted by Harmuth et al. (2018) involved the analysis of 161 articles. The study highlights the intricate needs of individuals with autism spectrum disorders, encompassing personal traits, contextual and environmental elements, and work-related issues. Emphasizing individualized, long-term assistance and accommodations in knowledgeable workplaces and communities is essential for successful employment. Employment support and training must be structured and methodical for individuals with ASD.

Furthermore, Wilczynski, Trammell, and Clarke's (2013) study highlights the need for improved support and educational systems by examining the issue of unemployment and

employment support for those with ASD. With the surge in ASD diagnoses, educators need to consider effective teaching practices and processes. Although schools have been responsible for teaching children with impairments for more than 160 years, the dismal employment rates of those on the autism spectrum raise concerns (Wilczynski, Trammell, and Clarke 2013).

Tailored employment interventions are intended to help individuals with ASD obtain and hold jobs, specifically aiming to improve social functioning and job stability for individuals with ASD. However, there is not enough high-quality data to support their effectiveness, according to this systematic review (Wilczynski, Trammell, and Clarke 2013).

Ohl et al. (2017) set out to investigate the employment experiences and factors that influence employment status for persons with ASD living in the US. The authors used an online survey and the Short Effort Reward Imbalance (ERI) Scale to gather data for the study. ERI is a psychosocial model that assesses the occupational-based psychosocial well-being of employees. Of the 254 adults with ASD, 61.42 percent had a job, while 38.58 percent did not, according to the data. More than half of the participants on the Short ERI Scale reported an imbalance in their jobs, and most of them did not receive any job support. The ERI model is based on the concept of social reciprocity, which proposes that perceived efforts at work should confer adequate rewards. An imbalance is found when there is a discrepancy between the perceived efforts (e.g., physical, emotional, and psychological demands) of the work one does and the rewards (e.g., money, esteem, and promotion prospects/job security) that one receives (Eddy et al. 2016). When compared to individuals who kept their ASD diagnosis a secret from their employer, more than three times as many participants were employed. Furthermore, education level was a significant predictor of work position. The findings suggest that disclosure of a disability and educational attainment are variables that influence job status.

In another study, Scott et al. (2015) looked at the factors affecting successful work outcomes for individuals with ASD and employers. The results show that differences in career expectations, workplace assistance, and productivity standards prevent successful employment despite the individual's commitment. To meet the demands of both groups, employers and employees must improve their communication. As an example, a gadget made especially for the office might facilitate this kind of communication.

Prevalence of ASD

ASD is a family of severe neurological developmental disorders usually diagnosed in children during the ages of 3 to 6, while there is growing evidence that some children may be diagnosed as early as the second year of life (Landa 2008). The frequency of ASD varies by continent and has an impact on communication skills and high-risk populations. A systematic review and meta-analysis of seventy-four articles published between 2008 and

2021 found that the global prevalence was 0.6 percent. Subgroup studies revealed that the prevalence in Asia, America, Europe, Africa, and Australia was 0.4, 1, 0.5, 1, and 1.7 percent, respectively (Salari et al. 2022). Early identification can improve communication skills and potentially reduce the prevalence of ASD. Communities worldwide bear a significant health burden due to the prevalence of ASD. Health policymakers should be aware of the increasing prevalence of ASD in order to develop and implement measures that will minimize its impacts (Salari et al. 2022).

Over the past ten years, the prevalence of ASD has increased, which has allowed for further systematic investigations into the causation factors and/or correlation indicators of ASD. In the study by Qiu et al. (2020), a systematic review of 2,195,497 participants in Asia from twelve relevant studies revealed a pooled ASD prevalence of 0.36 percent. The prevalence for men was greater (0.45%) than that for women (0.18%). Within regions, the prevalence of ASD was 0.35 percent in West Asia, 0.31 percent in South Asia, and 0.51 percent in East Asia. Given the increasing prevalence of ASD in Asia, universal and standardized diagnosis methodologies are necessary for prevention and control efforts.

Wang et al. (2018) conducted a comprehensive meta-analysis of the combined prevalence of ASDs in mainland China. Following a thorough database search, the researchers identified forty-four studies, including 2,337,321 participants, 46.66 percent of whom were female. The prevalence of autism was 10.18 per 10,000 people, whereas the prevalence of all ASDs was 39.23 per 10,000 people. Subgroup analysis showed that the prevalence of ASDs was significantly greater in men (72.77 per 10,000) compared to women (16.45 per 10,000). The study concluded that in comparison to other countries, China has a lower prevalence of autism and ASDs. To gain a better understanding of the prevalence variation, more research is necessary. ASD is a developmental condition that affects families as well as children and has major public health ramifications. Comprehensive reviews and meta-analyses of published research were conducted on the prevalence of ASD in the general population. Four studies were conducted, three of which focused on urban populations and one on a combination of urban and rural people. The rural study revealed a pooled percentage prevalence of 0.11 in children aged 1 to 18 years, compared to the urban study's 0.09 prevalence in children aged 0 to 15 years. The urgent need to investigate the disease's incidence and progress in the creation of rehabilitation services in the country is highlighted by the dearth of comprehensive population-based epidemiological studies on ASD in India (Chauhan et al. 2019).

The proportion of males and females with ASD was determined by Loomes, Hull, and Mandy (2017) using a meta-analysis of prevalence studies carried out following the DSM-IV/ICD-10. Across all trials, the pooled mean difference (MFOR) was 4.20, with a significant between-study variance. The MFOR for studies that screened the general population for the diagnosis of ASD was 3.25, but it was 3.32 for high-quality studies. The

true male-to-female ratio for children who match ASD criteria is closer to three to one, according to the study, and females who fit the criteria are disproportionately at risk of not receiving a clinical diagnosis.

PTEN is a cancer suppressor gene associated with hamartoma tumor syndromes (PHTS) and non-tumor characteristics such as macrocephaly. Cummings et al. (2022) found that developmental delays and ASD may be more common in individuals with germline mutations affecting PTEN. A pooled prevalence meta-analysis predicted a 25 percent incidence of ASD features, with developmental delay and intellectual disability being common. Emotional issues and reduced cognitive performance were observed, although they were evaluated less frequently. Twenty-five percent of people with constitutional PTEN mutations may be associated with or exhibit characteristics of ASD, according to this analysis. More extensive research is needed to better understand the psychological and behavioral effects of this mutation and how they connect to physical and physiological features.

Employment Outcomes for Individuals with ASD

Among Americans, only 6 percent of individuals with ASD find themselves in competitive employment (Cummings et al. 2022). This finding is concerning and raises questions about the outcomes for those with ASD finding employment. Consequently, research has shown that people with ASD also earn lower wages, have higher unemployment rates, and frequently change jobs, leading to a dwindling quality of life and cost implications (Dudley, Nicholas, and Zwicker 2015). With more children with ASD becoming adults, there is a need to invest in policies that enhance their employment prospects. Here, we will examine different employment determinants for individuals with ASD and propose interventions that might improve their future results in employment.

Dudley, Nicholas, and Zwicker (2015) studied the employment of individuals with ASD and found that IQ, socializing ability, and self-motivation were the major factors that determined success in finding employment. Furthermore, the research emphasized the need for inclusive special education programs, employers who are well informed, and vocational and rehabilitation support, which includes job coaching and technology-mediated training. Resources that are outside schools, jobs, and families can aid individuals with autism spectrum disorder in acquiring and keeping employment.

Another study by Burgess and Cimera (2014) showed that the employment outcomes of transition-age people with ASD who received vocational rehabilitation (VR) services in different states had different results. It showed that more youths were participating in VR than before but that they did not experience any substantial improvement in their employment. The study emphasized the need for more studies that can determine the factors within and among states, as well as between groups.

Similarly, a study by Cimera et al. (2012) found no difference between the employment rate of the supported employees with ASD and those who work in non-sheltered environments. Conversely, the participants who had worked in the workshops before starting supported employment earned less money and were more expensive to hire. This suggests that sheltered workshops are not ideal for ASD individuals and may even be harmful to their employment outcomes.

Alverson and Yamamoto (2017) performed a study to establish the relationship between virtual services and employment outcomes for young adults on the autism spectrum. The authors examined data from the Rehabilitation Services Administration 911 database that covered ten years. It showed that out of all VR clients with ASD, 37 percent found competitive employment. The research also showed that people who found employment attended at least twice as many VR services as those who did not. The mixed results suggest there is a need for more research in this area of VR services and employment outcomes for people with ASD.

The latest update by Westbrook et al. (2012) highlights the fact that the ASD prevalence has increased from one in sixty-eight to one in fifty-nine children in the US. This suggests the need for more studies and strategies on how to assist people with ASD in acquiring and sustaining a job. Employment outcomes of people diagnosed with ASD might be improved through behavioral and social interventions that are effective at supporting job discovery and retention (Fong et al. 2021).

However, some studies indicate that rather than their inability to complete assigned tasks, people with ASD are more likely to lose their jobs as a result of behavioral and social interaction issues. The review sought to ascertain the efficacy of employment interventions in helping adults and transition-age youth with ASD find and keep jobs. Three studies that evaluated the effects of interventions on employment outcomes suggested that career-focused initiatives might improve employment outcomes. To measure employment outcomes and confirm the efficacy of these interventions for people with ASD, rigorous trials of occupation-based interventions are required (Fong et al. 2021).

Pillay and Brownlow's (2017) systematic literature review aimed to identify which factors allow individuals with ASD to successfully transition into adulthood. The evaluation determined that key longitudinal measures affecting employment experiences, along with job-related interventions, ASD traits, behavioral interventions, functional independence interventions, and family advocacy interventions, may lead to positive employment outcomes. This poses questions for families, education policy, legislation, and practitioners as the studies give consistent results.

Factors Influencing Employment Success

In a meta-analysis by Holwerda et al. (2012) of the occupational trends of individuals with autism, only 25 percent of those with ASD made a living, and eighteen of the 204 articles met the requirements for inclusion. The authors classified seventeen variables as disease-related, internal, or external. This review found that the only important work outcome predictor was limited cognitive capacity, while the functional independence and institutionalization variables were significantly correlated factors. Nevertheless, the survey points out that additional cohort studies should address job participation as the main outcome for people with ASD.

The main objective of Kirby (2015) was to enhance understanding of the impact of different variables on participation outcomes in young people with ASD through a systematic review and a structural equation model using data from the National Longitudinal Transition Study-2. The study found that parents' expectations were a key factor in the relationships of family background, functional outcomes, and young adult active participation. Similarly to this, the study also conducted qualitative interviews with seven mothers of male adolescents with ASD to get an in-depth insight into these expectations. The interviews revealed three themes: the youth's preferences and situations, the mother's sentiments, mindsets, and emotions, and stories, myths, and stereotypes of society. The mothers also discussed how they prepare their sons for adulthood and explained how this affects young adult outcomes because of parental expectations. The results provide evidence that parental perceptions can significantly influence young adults in their realizations, highlighting the need for more studies on this issue and underscoring the importance of families and practitioners (Kirby 2015).

Walsh, Lydon, and Healy (2014), in their review, investigated the factors that influence employment or vocational placements of individuals with ASD. The evaluation of twenty-six studies revealed a paucity of research on employment and vocational skills among people with ASD. The review stated that successfully attaining a job significantly improves the individual's social status, financial independence, cognitive functions, and overall physical and mental health. The finding also highlighted the intricate interplay between internal and external factors as contributing to employment as a predictor and recommended the development of specific interventions targeted at individuals with ASD. Interventional studies found that while specific vocational skills improved, only a few skills were taught. The authors also discuss future research in this area and the implications of these findings for people with ASD.

Even though much research has been done on the employment results of ASD individuals, the research on the efficacy of tailored employment programming is still of low quality. Studies need to be designed in such a way as to determine the effectiveness of specific interventions and the factors that influence employment outcomes for individuals with ASD. Moreover, these studies provide educational implications for families, teachers,

lawmakers, and service providers as they try to promote employment success and maintain an acceptable social life for these individuals with ASD.

As more adults with ASD reach adulthood, it has become vital to develop employment avenues such as competitive, supported, and integrated employment models that will improve employment outcomes for people with ASD. Such initiatives must cooperate and engage with schools, employers, and families to help provide vocational and rehabilitative aid to people with ASD. By addressing all the factors that matter in employment success and implementing efficient strategies, we can give individuals with ASD more employment opportunities and consequently improve their quality of life.

A recent study examined how parents view the benefits of physical activity as it relates to after-school activities for children with ASD, delving into the intricate dynamics of these activities. To capture the nuances that help or hinder engagement in physical activities after school hours, the research used in-depth focus group discussions and a comprehensive online survey (Obrusnikova and Miccinello 2012). A focus group interview and an online open-ended questionnaire were used to gather information from 103 parents. The research analyzed the data by utilizing a socioecological model. Parents provided 225 responses, which were coded as benefits of physical activity [PA] (225), drawbacks of PA (106), facilitators of PA (225), and barriers to PA (250). Physical benefits were most frequently mentioned, followed by psychosocial and cognitive benefits. Physical and psychosocial drawbacks were present. Intrapersonal barriers were most frequently reported, followed by interpersonal, physical, community, and institutional ones. Intrapersonal facilitators were noted first, followed by physical, interpersonal, communal, and institutional facilitators. In the interviews, factors related to public policy were mentioned. Parental narratives provide a glimpse into the wide socioecological world that influences their offspring's employment prospects, showing their job prospects are significantly shaped by the interplay of personal attributes, family expectations, and societal opinions. This comprehensive qualitative study highlights the connections between development, social integration, and preparedness for the workforce. The goal of revealing these insights is to promote the creation of dedicated support networks and specialized programs. The ultimate objective is to facilitate the successful integration of people with ASD into the workforce and increase their access to jobs, therefore opening up avenues for long-term employment.

Adults with ASD have fewer employment options, but employment benefits society and the economy by lowering resource costs and lost productivity. However, few studies have looked at the cost-benefit analysis of hiring people with ASD from the employer's perspective. While employment provides social benefits and strengthens the economy, the employer must carry out a cost-benefit analysis. In their study, Jacob et al. (2015) performed a literature review and discovered that opening more positions for adults with ASD contributes to the betterment of society as well as from the financial aspect. Supported

employment designed for individuals leads to better results and cost savings. Even though the ASD community is the most expensive group to provide VR services for, with the right policies in place, they have a good chance of finding employment. However, little research has been done regarding the benefits and drawbacks; most pertinently, a cost-benefit analysis of hiring adults with ASD has not been conducted yet. Consequently, further investigations should be undertaken to comprehensively discern the possible advantages of hiring individuals with ASD.

Another work, by Black et al. (2019), aimed at identifying the relevant factors that would impact the successful employment rates of those with ASD, to enhance employment globally. The study was based on a community consultation methodology, in which nineteen persons were involved, including autistic individuals, family members, service providers, employers, researchers, and representatives of advocacy groups from three different countries. The researchers applied the International Classification of Functioning, Disability, and Health (ICF) framework in a directed content analysis and identified the relevant variables that are critical for employment success among persons with ASD. The results indicated that top categories such as activity, participation, and environmental factors are highly significant for employment. This study calls for the provision of workplace adjustments and the removal of barriers to enhance employment performance for those with ASD.

In addition, Yamamoto and Alverson (2022) sought to fill the gap in the knowledge of post-secondary outcomes (PSO) among individuals with ASD using state data and predictive modeling. The analysis used multilevel logistic regression and machine learning to analyze data from two different states and evaluated the predictive accuracy using Receiver Operating Characteristic (ROC) to identify potential correlations at various threshold values. The evidence indicated that high school completion was the most influential factor causing PSO in those with ASD. Furthermore, machine learning was more accurate than multilevel logistic regression in predicting PSO participation in both states. According to the results, the researchers advocated for the use of predictive analytics models to analyze PSO state data because these models generated relatively accurate and stable results over time. The extracted results could influence the formulation of policies, programs, and practices from state or local educators concerning individuals with ASD transitioning into adulthood.

By addressing communication issues, the article by Tomczak (2021) investigates the potential advantages of digital technology for workers with ASDs. Along with eliminating the environmental and social barriers, the consideration of assistive technology (AT) solutions will work in favor of individuals with ASD in terms of improving accessibility and providing support. Tomczak (2021) investigated the proposed use of digital technologies, especially wearable electronic systems, which have proven to be instrumental in ASD communication problems. Using AT, which enables wearable electronic systems to monitor

stress levels and facilitate effective stress management, can improve accessibility in the workplace. By using sensors to detect stress levels, individuals with ASD can better cope with stress at work, leading to an improved working environment. Moreover, the author introduced the concept of a “smart workplace,” using networked sensors to reduce distractions and improve communication, stress management, and sensory conditions for individuals with ASD and their co-workers. This new method has been approved by subject-matter experts, which indicates that it could be implemented in the future.

It is important to note that other leadership styles can be harmful to employees with autism in the workplace. According to research by Parr, Hunter, and Ligon (2013), transformational leader behaviors influence organizational outcomes for people with ASD. The results suggest that transformational leader behaviors that are particularly applicable to communication and social interactions may cause anxiety and result in negative work outcomes. On the other hand, the personalized attention shown by transformational leadership and other components of this leadership may help to ease anxiety and improve individual-oriented outcomes of this disorder. However, the study also demonstrated that subjective job performance, which is largely determined by individualized consideration, was not supported by the results. Such findings indicate the need for additional research on transformational leadership’s role in employing individuals with ASD and its consequences for performance outcomes.

To perform a thorough meta-analysis, a methodical research procedure was followed, including a thorough search of reputable academic databases like PubMed, PsycINFO, and Scopus. This was a planned search that adhered strictly to the inclusion criteria specified in the study plan for finding noteworthy articles published in the year 2000. The rigorous processes taken in the literature search and selection phases have been summarized in a clear flowchart in Figure 1, which improves the clarity and repeatability of our research methodology. After a rigorous screening procedure, the chosen articles were subjected to a thorough evaluation to extract relevant trends and insights. Strict methodological rigor was used in the design of the meta-analysis to guarantee a comprehensive and accurate representation of the corpus of research on the variables influencing successful employment for those on the autistic spectrum.

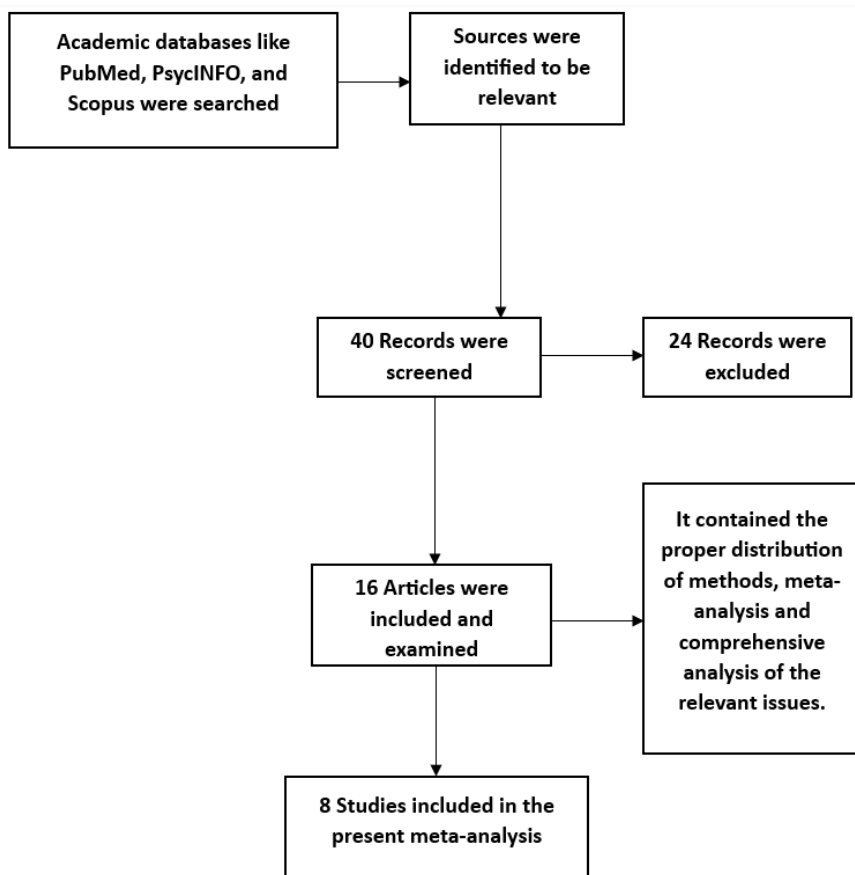


Figure 1: The Flowchart of the Literature Search and Selection

In addition, the research stressed the significance of taking individual differences into account and tailoring the workplace environment to the needs of those with ASD. Individualized consideration, an approach that considers the special needs of employees on a personal level, can be particularly good for ASD employees. In this regard, businesses should endeavor to set up a work environment that is both inclusive and supportive for people with ASD, ensuring that their specific needs are considered and providing necessary accommodation.

Inclusion Criteria

Research on job outcomes for people with ASD, published in peer-reviewed publications with a transparent methodology and sample descriptions, was included in the analysis (Mikolajewicz and Komarova 2019). The study also discussed other factors that were pertinent to the research.

Quality Assessment

Reviewers employ a systematic procedure called formal quality assessment to appraise the caliber of the studies they have found and to decide which ones to exclude (Mikolajewicz and Komarova 2019). Each study is graded according to its overall quality and scientific rigor, considering factors such as publication in a peer-reviewed journal, full statistical reporting, randomization, blinded analysis, sample size calculation, investigation of the dose–response relationship, and regulatory compliance (Vesterinen et al. 2014). Assessing objective alignment between the study and the meta-analytic project is another task for reviewers. They should consider whether the outcome of interest was the main goal of the study or only a supporting or secondary outcome. According to Mikolajewicz and Komarova (2019), aggregate quality ratings are calculated by adding the satisfied criteria and comparing the study quality with outcome estimates and heterogeneity. Considerable divergence from lower-caliber research may call for the exclusion of a study in a later analysis.

Data Extraction and Synthesis

Data on employment rates, sample characteristics, and factors affecting employment outcomes will be retrieved from a subset of research. To produce a qualitative summary, a narrative synthesis and systematic review will be carried out (Mikolajewicz and Komarova 2019). An outcome estimate that includes all findings at the study level should be the goal of any meta-analysis. One of the meta-analysis’s core characteristics is its capacity to incorporate information on the caliber, quality, and reliability of the primary research by prioritizing larger, better-reported studies (Mikolajewicz and Komarova 2019).

Statistical Analysis

Despite the common belief that primary investigations have more statistical power than meta-analyses, this is not necessarily the case (Jackson and Turner 2017). A meta-analysis will be carried out in this study to measure the employment rate for people with ASD, generally, and look into possible sources of heterogeneity (Mikolajewicz and Komarova 2019). The research publications that are part of the meta-analysis are highlighted in Table 1.

Table 1: The Research Articles Included in Meta-Analysis

<i>Author/Year</i>	<i>Method</i>	<i>Result</i>
Alverson and Yamamoto 2017	Descriptive Study	Less than 1% of VR cases between 2003 and 2012 involved 49,623 clients with ASD, with less than 1% of the cases having missing data. Missing data cases were not included in subsequent statistical evaluations.

Burgess and Cimeria 2014	Quasi-experimental study, regression analysis	Excluding Washington, D.C., U.S. territories, and VR Services for the Blind, the study examined data from 34,314 transition-aged adults with ASD. Regression analysis statistics were used to compare employment outcomes over ten years. The results of transition-aged adults with ASD were compared to those of the overall transition-aged population served by VR using <i>t</i> -test test statistics. Mean data for the entire transition-aged population was included for comparison to the ASD group.
Fong et al. 2021	Systematic review	Vocation-focused programs may have a positive effect on employment outcomes for people with ASD, according to three studies. At the nine-month and one-year follow-up points of Project SEARCH, treatment participants had higher employment rates, and virtual reality job interview training resulted in more job offers.
Harmuth et al. 2018	Systematic literature review	The analysis of 161 articles reveals the complex requirements of adults with ASD, including personal characteristics, context- and environment-specific supports, and work-specific elements like job coaching and training.
Jacob et al. 2015	Systematic literature review	Increasing employment opportunities for adults with ASD is advantageous for society, inclusivity, and the economy. Services for supported employment improve results while lowering costs. To ascertain the costs, benefits, and cost-benefit ratios, more investigation is required.
Ohl et al. 2017	Cross-sectional study	According to the study, 61.42% of 254 adults with ASD were working, compared to 38.58% who were unemployed. Most people reported job inequalities but did not receive job support. The likelihood of finding employment increased when an ASD diagnosis was disclosed, and education level was a significant predictor.

Walsh, Lydon, and Healy 2014	Systematic literature review	There has been little research on employment and vocational skills among people with ASD, according to a review of twenty-six studies. However, employment has a positive effect on well-being, cognitive ability, and quality of life. Employment is predicted by both internal and external variables. Improvements in specific vocational skills were noted in intervention studies.
Yamamoto and Alverson 2022	Predictive analytics	The strongest predictor of PSO for ASD exit students was high school graduation, and machine learning outperformed multilevel logistic regression in predicting engagement across two states.

Analysis

There are numerous factors included in this research, as determined by the literature chosen for the aforementioned study. The authors of the study determined several causes of the low employment rates of adults with ASD. These components are listed in Figure 2.

Communication and social skills deficits
Sensory sensitivities
Restricted interests and repetitive behaviors
Lack of job experience
Discrimination

Figure 2: Elements Contributory Factors to the Low Employment Rates of Adults with ASD

Adults with ASD often struggle with communication, social skills, sensory sensitivity, narrow interests, repetitive behaviors, lack of work experience, and discrimination at work (Figure 2). These deficiencies may limit their capacity to adjust to specific settings and work

environments, which may also make it more challenging for them to obtain and hold a job. Additionally, it may be difficult for them to obtain and maintain employment due to their lack of work experience. Furthermore, discrimination at work might make it harder for them to get a job or advance in their career. Additionally, the researchers found that several interventions have the potential to improve adult ASD workers' employment prospects.

To develop the skills necessary for obtaining and maintaining employment, adults with ASD must receive vocational training, job coaching, social skills instruction, sensory integration therapy, and supportive employment (Figure 3). Job coaching offers guidance and support, while social skills training improves communication and interaction. Individualized jobs tailored to specific needs are available in supported employment, and sensory integration therapy helps individuals manage their sensitivity to certain stimuli. Apart from the factors and interventions discussed in this study, there exist several other factors that could potentially affect the employment outcomes of adults diagnosed with ASD. These variables include the individual's interest, the degree to which the ASD is severe, and the accessibility of supporting services. Adults with ASD face challenging job outcomes that require attention. The research sheds light on the reasons behind low employment rates and the most effective approaches to improve employment outcomes. By becoming more aware of these factors and interventions, we can help make the workplace a more welcoming environment for adults with ASD. To expand our knowledge and make connections with accepted theories, it is essential to look closely at the key ideas that the meta-analysis revealed. Speech impairment, social skills, sensory sensitivity, and confined repetitive behaviors of ASD are the only factors that indicate the influence on employment outcome. This fits in with the social communication challenges that are characteristic of ASD and are outlined in the Autism Social Communication Model. Determining interventions and supporting modifications requires, in fact, an understanding of how core symptoms relate to job performance and social dynamics at workplaces (Waisman-Nitzan, Gal, and Schreuer 2021). In addition, early intervention and support programs need to be considered in terms of their ability to help individuals with ASD get ready for the workforce. According to the social models of disability, social integration and environmental modifications are important strategies for promoting participation and addressing the welfare of populations with impairments. This enables researchers to contrast theories of social inclusion and disability rights advocacy with early intervention and support systems.

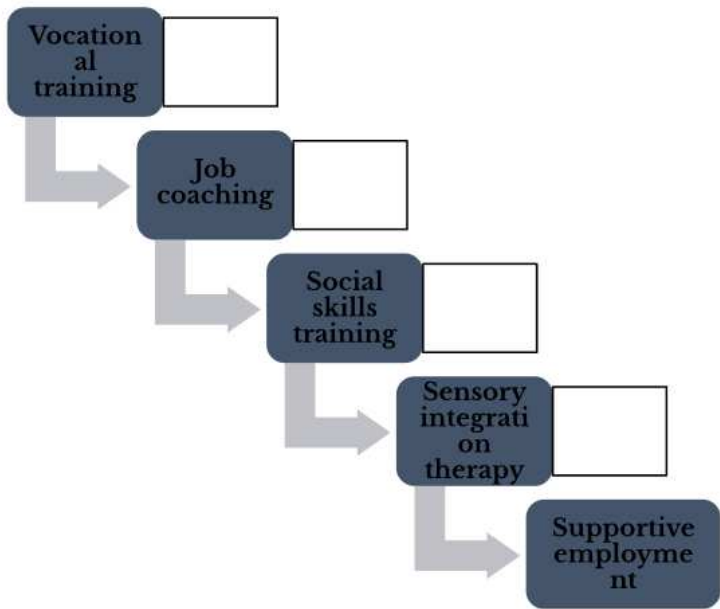


Figure 3: Interventions for Adults with ASD for Employability

To determine the impact of workplace discrimination on employment rates, all such concerns would need to be thoroughly investigated, especially in relation to the broader societal interactions with individuals who have ASD. According to the Social Model of Disability, attitudes and social norms have erected hurdles that have exacerbated the exclusion of people with disabilities from the workplace. Information that is currently accessible can be used to analyze how discrimination against people with ASD is practiced in the workplace. To properly understand and solve the complex issues of structural inequalities being imposed on persons with ASD at work, it may be helpful to draw examples from theories of social justice and equality, such as the Social Model of Disabilities or Critical Disability Theory (Hall 2019). These conversations, if included in the meta-analysis’s conclusions, would illustrate the challenges faced by those with ASD in the workforce, as well as their potential. Consequently, policy recommendations from the studies and evidence-based interventions may prove helpful.

Limitations of the Research

It is necessary to recognize the limits of the comprehensive meta-analysis approach to appropriately interpret the findings. The reliability of a meta-analysis depends on the availability and accuracy of the data from the chosen studies and inconsistent or sparse data reporting may have a negative effect (Harrison 2011). The strength and generalizability of

findings may also be affected by the heterogeneity of studies. The variety of research may also affect the findings' strength and generalizability (Sanabria et al. 2012). Appropriate statistical techniques are needed to handle this. Publication bias affects effect sizes and generalizability by favoring research with noteworthy or positive results (Blanchard et al. 2021).

One of the most noteworthy conclusions of the research is that ASD is diagnosed in more men than in women. Surprisingly little research has been carried out on the reasons behind this discrepancy. A deeper comprehension of this sex difference may lead to significant advancements in the prevention or treatment of ASD in both males and females (Halladay et al. 2015).

The outcomes of the meta-analysis may not apply to all individuals with ASD because it is based on research of certain geographic areas and subgroups (Blanchard et al. 2021). Furthermore, as the meta-analysis looks at factors that influence job outcomes for people with ASD without particularly addressing any specific programs or interventions, its focus on specific employment interventions is limited. Further research is necessary to evaluate the effectiveness of various employment support programs.

Recommendations

The following recommendations can help increase the employment rate of individuals with ASD generally. Increasing the employment rate of people with ASD requires a multifaceted approach that considers their unique demands and obstacles. Developing and implementing VR programs, especially for people with ASD is a crucial tactic. These courses ought to help with social interaction, sensory sensitivity, and other roadblocks at work. Those with ASD can succeed in professional settings and meet employment expectations by addressing these issues. Another suggestion is that early intervention programs play a crucial role in preparing young individuals with ASD for future employment by establishing the essential skills and trustworthy support systems at a young age. Early involvement aids in the development of critical social, adaptive, and communication skills that are necessary for successful integration into any type of workplace. Investing in early intervention strengthens their employability and offers increased independence and self-sufficiency, providing a solid foundation for future career advancement.

To make it easier for people with ASD to transition from school to the workplace, businesses, academic institutions, and educators must work together. Thorough transition plans must be carefully constructed, with precise objectives, individualized methods for improving skills, and modifications to the work environment that are appropriate for each worker. By working together, we can ensure that these people start their professions with the tools and assistance they need. Additional assistance, such as career coaching and mentorship,

can also be beneficial in helping people with ASD overcome obstacles at work, understand social cues, and efficiently communicate with co-workers and managers. This improves their work performance and increases the likelihood of long-term employment success.

To ensure the successful integration of workers with ASD into the workforce, it is imperative to create inclusive work environments that can easily adjust to the various demands of these workers. A strategy like this ought to include things like creating sensory-sensitive environments, offering flexible scheduling, and providing individualized communication tools. By making these considerate adjustments, businesses may create environments that support the successful and productive participation of people with ASD.

Educating and enlightening leaders, company owners, and co-workers are crucial to creating a friendly environment for individuals with autism spectrum disorders. Customized training that explores the subtleties of ASD, including its symptoms and useful support techniques, can dramatically change the inclusive ethos of the workplace. Increased comprehension opens doors to employment environments where people with ASD are appreciated and accepted. Using and appreciating the distinctive abilities that people with ASD often possess is another recommendation, as this will help them feel more empowered in the workplace. Encouraging these people to take advantage of their natural abilities—such as their meticulousness, exceptional memory for details, and ability to recognize patterns—can help place them in positions where their contributions are significant and meaningful. Establishing internal support groups or mentorship networks also fosters a culture of inclusivity in the workplace by providing much-needed companionship and solidarity.

Ongoing evaluation, helpful criticism, and unwavering support continue to be essential strategies for advancing people with ASD in the workplace. Understanding work performance is made possible by constructive evaluations and continuous feedback, which also point out areas for growth and encourage self-improvement. Advocacy efforts aimed at equitable employment laws enhance workplace integration for individuals with disabilities such as ASD. Promoting fair employment regulations through advocacy improves workplace inclusion for people with impairments, including ASD. Furthermore, collaborations with organizations that support people with ASD strengthen workplace inclusion initiatives. When these strategies are consistently applied, workplaces may transform into empowering spaces where people with ASD can flourish and reach their full potential.

Conclusion

To promote financial stability, social inclusion, and overall well-being, it is imperative that this meta-analysis on employment outcomes for individuals with ASD be implemented. In addition to examining recent and prior studies, it will recommend targeted interventions and evidence-based strategies. It is imperative that policymakers, educators, and employment help organizations consider the results of this study.

The literature on VR services and employment results for individuals with ASD emphasizes the need for individualized treatments, early planning, and collaboration between educators, employers, and support organizations. VR service usage is increasing in a way that supports competitive employment rates.

Problems persist, nonetheless, necessitating the development of therapies that challenge accepted paradigms. Recognizing the abilities of employees with ASD is crucial, as is creating inclusive workplaces through education and advocacy.

Effective transition planning, cost-benefit evaluations, and targeted employment interventions are also suggested. These tactics assist persons with ASD to flourish in a range of work situations, including job coaching, support networks, and seamless transitions. However, interdisciplinary collaboration, innovative interventions, and a comprehensive approach are needed to expand employment prospects, improve quality of life, and create a fairer future.

The suggested approaches offer an ingenious and complex way to improve employment opportunities for people with ASD. One significant advancement is the availability of interventions that are specifically designed to meet the unique needs and abilities of every person with ASD. These assessments deftly address issues like social skills, sensitivity to stimuli, and other roadblocks to success, eschewing unsatisfactory one-size-fits-all approaches. We are proactively providing young people with ASD with essential skills and assistance by prioritizing early intervention programs, which will lay a solid basis for them when they enter the workforce.

This strategy also supports a personalized, hands-on network of support in the workplace, which includes job coaching and mentorship—a refreshing shift from the standard expectation that those with ASD adjust to the work environment. This is a welcome departure from the conventional belief that people with ASD will naturally adapt to their new environment. Rather, we advocate for creating inclusive environments through focused instruction and assistance. The tactic also presents an empowering perspective, emphasizing the importance of focusing on a person's assets rather than weaknesses. This mindset emphasizes the positive contributions people with ASD can make to various professions, such as increased accuracy and sophisticated pattern recognition abilities. These kinds of interventions not only support people with ASD but also enhance the workforce by utilizing their remarkable qualities. These empirically validated techniques provide a progressive way to support individuals with ASD along their career paths, paving the way for enhanced engagement and opportunities in the workplace.

Data Availability Statement

Data is available on request from the author.

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Generative AI or AI-assisted technologies were not used in any way to prepare, write, or complete essential authoring tasks in this manuscript.

Conflict of Interest

The author declares that there is no conflict of interest.

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