Short reports

A pilot study of PEERS® for Careers: A comprehensive employment-focused social skills intervention for autistic young adults in the United States

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ABSTRACT

Background: Autistic young adults are at elevated risk for poor employment/internship outcomes, despite having many strengths relevant to the workplace. Currently, very few employment interventions for this population comprehensively promote skills development and success across the various stages of employment.

Aims: To address this gap, the current study aimed to test the feasibility, acceptability, and efficacy of a novel college to career intervention program, PEERS® for Careers.

Methods and Procedures: Twelve autistic young adults (19–30 years old) were enrolled and matched to a career coach. The pilot program consisted of 90-minute sessions delivered twice per week, for 10 weeks, covering content relevant to obtaining, maintaining, and thriving in employment/internship settings.

Outcomes and Results: Results indicated that young adults showed a significant improvement in employment-related social skills knowledge, \( p < .001 \). Participants also reported significant improvements in their feelings of preparedness for employment over the course of the study, \( p = .009 \), with all young adults self-identifying as “somewhat prepared” or “very prepared” post-intervention. Additionally, in only a brief 10-week intervention, a slight increase in participants who secured or maintained internship/employment-related activities was observed. Overall, lesson content and coaching were perceived as helpful. No significant changes were observed in self-reported autism symptomatology.

Conclusions and Implications: In sum, the PEERS® for Careers program shows promise as a college to career intervention program for autistic young adults.

What This Paper Adds: There is a dearth of evidence-based interventions for autistic young adults, despite significant need for supports to bolster vocational and relational success. This paper is the first to evaluate the PEERS® for Careers intervention in a pilot study by exploring feasibility, acceptability, and efficacy of this novel college to career intervention program, which teaches ecologically valid employment-related skills using a strengths-based approach. Results suggest...
1. Introduction

Young adults on the autism spectrum\(^2\) are more likely to be unemployed than their peers, including those with other disabilities (Shattuck et al., 2012). Those that do obtain employment are more likely to be underemployed, work part-time, and/or be paid lower wages (Chen et al., 2015). Many barriers to employment have been identified for autistic adults, including environmental factors, such as stigma and employer knowledge of autism (Scott et al., 2019). However, the vocational challenges of autistic individuals have also been linked to the differences in social communication that are characteristic of autism (Chiang et al., 2013). These data are echoed in stakeholder perspectives, where professional social communication emerges as one of several prominent barriers to employment success in this population (Black et al., 2020).

Despite these challenges, it is essential to recognize the strengths of autistic individuals in the workplace. People on the autism spectrum tend to be dependable, detail-oriented, and persistent, all of which are assets in the workplace (Scott et al., 2019; Solomon, 2020). Autistic people are also more likely to have strong technical skills, patience for repetitive tasks, and specialized interests or knowledge, qualities that may make them well-suited for particular jobs or industries (Scott et al., 2019; Solomon, 2020). Indeed, despite stigma and negative stereotypes, employers that hire adults on the spectrum report greater benefits than costs and favorably evaluate the performance of autistic employees (Solomon, 2020)

Over the last decade, interventions targeting employment-related skills in autistic adults has become a burgeoning area of research. However, the methods and scope of interventions have varied widely. Some programs have held a narrow focus, only teaching interviewing skills (Smith et al., 2021) or specific hard skills (e.g., photocopying, stocking; Walsh et al., 2014). Others have utilized a supported employment model in which individuals on the spectrum rotate through internships while being provided on-the-job coaching (Wehman et al., 2019). Pilot studies have also begun to examine interventions targeting the soft skills needed once employed (e.g., communication, professionalism, networking, collaboration; Sung et al., 2019).

All of the above intervention approaches have demonstrated some efficacy in improving outcomes in targeted areas; however, none fully address the comprehensive set of skills needed to obtain, maintain, and thrive in internships/employment. Further, one review has suggested that more than 70% of interventions studies in this population use an impairment-focused model, rather than strengths-based (Scott et al., 2019). The current study aimed to test the feasibility, acceptability, and efficacy of a novel college to career intervention program, PEERS® for Careers, which sought to address these gaps. PEERS® for Careers was informed by other PEERS® programs, which have a strong evidence base for use with autistic individuals (Laugeson et al., 2015). However, the PEERS® for Careers model does not seek to change the autistic individual, but instead provides instruction in ecologically valid employment-related skills that would promote any individual’s vocational success. Additionally, PEERS® for Careers encourages reflection on one’s own interests, personality, and strengths to inform career choice, alongside individualized coaching.

2. Methods

2.1. Participants

Participants included 12 individuals with a previous diagnosis of autism spectrum disorder (ASD), confirmed by the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012), some college experience (e.g., community college, technical college, 4-year university), and an intelligence quotient (IQ) of 85 or higher on the Wechsler Abbreviated Scales of Intelligence, Second Edition (WASI-II; Wechsler, 2011). Ten participants completed the full 10-week intervention. The two participants who dropped were unable to continue with the program due to scheduling conflicts with employment-related activities they had obtained. There were no significant differences in age, gender, ethnicity, autism features, or cognitive ability between program completers and non-completers. See Table 1 for demographic data.

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\(^2\) Given research showing the preferences of the autism community (Bury et al., 2020), identity first language (e.g., “autistic adults”) and language describing individuals as “on the autism spectrum” will be utilized throughout this article.
To inform curriculum development, focus groups were held with parents (n = 31) and autistic young adults (n = 22; ages 19–33) to identify intervention priorities for autistic adults seeking internships/employment. Focus groups included a set of six open-ended questions to facilitate small group discussion about employment experiences and needs (e.g., “Have you ever sought employment and what were your experiences?” “What potential barriers do you foresee in seeking and obtaining employment?” “What types of services would you like to have to assist you with finding and maintaining employment?”). In addition to these discussions, focus group participants also completed surveys to rank topics and skills areas from most to least important from their perspective. The survey also included space for an open-ended response to list additional topics or skills they would like included in an employment-focused program. Both young adults and parents identified skills related to finding and applying to internships/employment as top intervention priorities. Following these, focus group participants expressed interest in skills related to interviewing, understanding workplace culture, reciprocal conversations, and organization/executive functioning. Notably, autistic adults ranked resume writing skills as significantly more important than did their parents, t(51) = 3.0, p = .005. In contrast, parents assigned higher rankings to peer initiation skills, such as starting and entering conversations, than did young adults, t(51) = 2.8, p = .007.

A PEERS® for Careers curriculum, informed by the intervention priorities identified in focus groups, was developed (see Table 2). Many skills were adapted for workplace settings from former PEERS® curriculum (e.g., conversational skills, humor, handling disagreements, responding to bullying; Laugeson et al., 2015). Common and well-established stress management (e.g., deep breathing) and organizational skills (e.g., to-do lists) were included. Additionally, based on identified needs, novel employment-focused skills were developed, including rules and steps for resume writing (e.g., typical sections, use of active verbs), networking (e.g., requesting an informational interview, common questions), and interviewing (e.g., how to start/end interview, developing a “me, you, us story” to highlight the fit between you as a candidate and the position).

To teach the identified skills, the intervention utilized components of effective social skills interventions (Moody and Laugeson, 2020), including a small group format, didactic lessons with concrete rules and steps, role play demonstrations, behavioral rehearsal exercises, involvement of a coach, and weekly homework assignments. Homework assignments were focused on practicing and applying skills taught in the program (e.g., conduct a mock interview with your career coach, practice starting a conversation with your career coach, create/revise a professional resume, conduct an informational interview with a person in your field of interest, apply to jobs). Participants attended two 90-minute in-person sessions per week, for 10 weeks, on the University of California, Los Angeles (UCLA) campus. Sessions comprised of approximately: 30 min of homework review, 30–40 min didactic lesson, and 20–30 min behavioral rehearsals to apply skills. Each young adult was assigned a career coach who assisted with homework assignments and provided support related to employment issues. Career coaches, who were undergraduate or graduate student volunteers, attended separate but concurrent sessions to learn content and coaching strategies. Previous experiences with employment and fields of focus for career coaches varied, though all coaches were interviewed and subsequently went through a 10-week training program specific to this intervention and this population prior to being paired with a young adult participant. The 10-week training followed the structure of

### Table 1
Descriptive statistics for demographics and characterization of sample.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Program Starters (n=12)</th>
<th>Program Completers (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>23.8 (3.4)</td>
<td>23.6 (3.5)</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>91.7 %</td>
<td>90 %</td>
</tr>
<tr>
<td>Ethnicity (% Caucasian)</td>
<td>66.7 %</td>
<td>60 %</td>
</tr>
<tr>
<td>ADOS-2 Module 4 Algorithm Total</td>
<td>10.7 (2.2)</td>
<td>10.9 (2.2)</td>
</tr>
<tr>
<td>ADOS-2 Calibrated Severity Score</td>
<td>6.0 (1.3)</td>
<td>6.2 (1.2)</td>
</tr>
<tr>
<td>WASI-II FSIQ-2</td>
<td>110.2 (20.9)</td>
<td>109.3 (23.0)</td>
</tr>
<tr>
<td>SRS-2 Total T-Score</td>
<td>61.4 (12.2)</td>
<td>61.9 (12.2)</td>
</tr>
</tbody>
</table>


### Table 2
List of targeted skills addressed within PEERS® for Careers pilot implementation.

<table>
<thead>
<tr>
<th>Week in Intervention</th>
<th>First lesson</th>
<th>Second lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Choosing a Career</td>
<td>Resume Development</td>
</tr>
<tr>
<td>2</td>
<td>Conversational Skills</td>
<td>Starting and Entering Conversations</td>
</tr>
<tr>
<td>3</td>
<td>Assessing Interest and Exiting Conversations</td>
<td>Electronic Communication and Professional Social Media</td>
</tr>
<tr>
<td>4</td>
<td>Finding Employment Opportunities</td>
<td>Disclosing Diagnoses and Requesting Accommodations</td>
</tr>
<tr>
<td>5</td>
<td>Interviewing skills</td>
<td>Interviewing skills</td>
</tr>
<tr>
<td>6</td>
<td>Organization and Executive Functioning Skills</td>
<td>Managing Stress in the Workplace</td>
</tr>
<tr>
<td>7</td>
<td>Navigating Workplace Culture</td>
<td>Appropriate Use of Humor in the Workplace</td>
</tr>
<tr>
<td>8</td>
<td>Responding to Disagreements in the Workplace</td>
<td>Bringing up Disagreements in the Workplace</td>
</tr>
<tr>
<td>9</td>
<td>Handling Direct Bullying in the Workplace</td>
<td>Handling Indirect Bullying in the Workplace</td>
</tr>
<tr>
<td>10</td>
<td>Where to Go from Here</td>
<td>Graduation</td>
</tr>
</tbody>
</table>
the intervention (i.e., meeting twice weekly for 90 min), such that all coaches were exposed to and practiced skills to be taught in lessons, including choosing a career, resume writing, interviewing skills, stress management, and conflict resolution. Coaches were also provided with general psychoeducation about autism during this time. Group leaders and career coaches individualized instruction during homework review and completion based on the participant’s career goals and strengths.

Participants’ vocational outcomes, employment-related social skills knowledge, and autism symptomatology was assessed at three time points: pre-intervention, post-intervention, and 10-week follow-up. Career coaches also reported on their employment-related social skills knowledge at all three time points. Participant feedback on program content, structure, and satisfaction was also collected. The study was approved by and conducted in compliance with the UCLA Institutional Review Board.

2.3. Measures

2.3.1. Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2; Lord et al., 2012)

The ADOS-2 is a gold-standard, semi-structured observational measure with extensive evidence as a reliable and valid instrument to assess the presence of ASD.

2.3.2. Wechsler Abbreviated Scales of Intelligence, 2nd edition (WASI-II; Wechsler, 2011)

This abbreviated measure of verbal and nonverbal IQ produces a Full-Scale IQ estimate (FSIQ-2) using the Vocabulary and Matrix Reasoning subscales. The FSIQ-2 has been found to have adequate reliability and validity.

2.3.3. Social Responsiveness Scale, 2nd edition (SRS-2; Constantino and Gruber, 2012)

The SRS-2 is a 65-item questionnaire that measures differences in social behavior associated with autism features. The SRS-2 yields a total T-score, with scores > 60 considered within the clinical range of autism features. The SRS-2 Adult Self-Report form was used.

2.3.4. Test of Employment Social Skills (TESS)

The TESS is a novel, 36-item criterion-referenced measure created to assess young adults’ knowledge of the specific social and employment-related skills taught during the intervention. Career coaches also completed the TESS at all three timepoints. Similar criterion-based measures have been used with utility in other PEERS® programs, though these measures did not focus on employment-related skills (Laugeson et al., 2015). The TESS includes 36 items, which each have two response options. Example items include: “Developing friendships with coworkers is considered: (1) unprofessional and can be distracting, or (2) good for morale and camaraderie,” “Cover letters should be: (1) customized, or (2) universal,” and “It is inappropriate to talk about salary and compensation during an interview: (1) true, or (2) false.” Though limited by the current small sample size (n = 24, including coaches and young adult participants), reliability was acceptable, α = 0.785. Across intervention timepoints (i.e., baseline, post, and follow-up), TESS scores were also significantly correlated with each other, another indicator of reliability. Validity was supported by career coaches achieving significantly higher scores than autistic participants on the TESS at both baseline (career coaches: M = 29.00, SD = 2.45; participants: M = 19.83, SD = 3.49), t(22) = 7.45, p < .001, and post-intervention (career coaches: M = 31.67, SD = 0.99; participants: M = 26.80, SD = 3.77), t(10.03) = 3.98, p = .003. To test convergent validity, we ran correlations between TESS scores and SRS-2 Total T-scores at baseline, while discriminant validity was assessed through correlation with nonverbal IQ estimates on the WASI Matrix Reasoning. Knowledge of employment-related social skills on the TESS was negatively correlated with autism features on the SRS-2, r = −0.30, which is the expected direction with a medium effect size; however, the correlation was not significant, possibly due to our small sample size (n = 12). In support of discriminant validity, TESS scores were not significantly correlated with WASI Matrix Reasoning, r = −0.07.

2.3.5. Employment and intervention surveys

In addition to the above measures, survey items were used to assess current internship/employment status, internship/employment history, subjective perspectives on employment-related topics, and perceptions of intervention format, components, and content. Items to assess acceptability and utility of different program components (e.g., career coaching, curriculum, specific lessons) were included utilizing a Likert-scale from 0 (not at all helpful) to 10 (very helpful).

2.4. Data analytic plan

Analyses were conducted in SPSS and Stata. To assess change over time in continuous outcome variables, including the TESS, feelings of preparedness for employment, and SRS-2, multilevel models were planned. Multilevel models were utilized due to repeated measurement over time within individuals. Multilevel models were conducted in Stata using the mixed command. For binary outcomes, including engagement in employment-related activities, having a career action plan, and conducting a recent informational interview, percentages at baseline and post-intervention were reported due to lack of power. To identify whether participants consistently found certain lessons more or less helpful, a non-parametric Friedman test was employed to analyze rankings on the Intervention Survey.
3. Results

3.1. Employment-related outcomes

Results indicated that young adults showed significant changes in employment-related social skills knowledge on the TESS, $\chi^2(2) = 31.81, p < .001$, with significant improvements from baseline ($M = 19.83, SD = 3.49$) to post-intervention ($M = 26.80, SD = 3.77$), $z = 5.56, p < .001$. Notably, young adults’ post-intervention TESS scores did not significantly differ from career coaches’ scores at baseline, $t(20) = 1.65, p = .114$, suggesting employment-related social skills knowledge after the intervention was comparable to that of neurotypical young adults in higher education. Additionally, autistic adults’ employment-related social skills knowledge at the end of the follow-up period ($M = 24.00, SD = 4.54$) did not significantly differ from post-intervention, $z = -1.82, p = .068$, and continued to represent a significant improvement as compared to baseline knowledge, $z = 3.28, p = .001$.

The majority of this small sample of autistic young adults either secured or maintained internship/employment-related activities (e.g., paid employment, internship, or volunteer positions) during the 10-week intervention. Of the 10 participants that completed the 10-week program (“completers”), 40% ($n = 4$) began the program already engaged in employment-related activities; this number rose to 60% ($n = 6$) post-intervention (i.e., two additional participants: one obtained a volunteer position, one obtained paid employment). At post-intervention, five of the six participants engaged in employment-related activities endorsed receiving compensation for their internship or employment, while one was engaged in a volunteer position. The two young adults who dropped from the program were also in paid employment positions when they discontinued, one of whom was unemployed at pre-intervention. The majority of young adults endorsed having a career plan (80%) and conducting a recent informational interview (60%) post-intervention, while only 30% had done either at baseline. Additionally, while 30% of completers rated themselves as “somewhat unprepared” or “very unprepared” for employment at baseline, all young adults self-identified as “somewhat prepared” or “very prepared” for employment following the program. The overall model examining changes in feelings of preparedness over the course of the study was significant, $\chi^2(2) = 9.54, p = .009$, with significant improvements in adults’ self-perceptions of preparedness for employment from baseline to follow-up, $z = 3.07, p = .002$. Finally, no changes were observed over the course of the study autism features as measured by the SRS-2, $\chi^2(2) = 1.42, p = .492$.

3.2. Perceptions and satisfaction

Participants reported high satisfaction with the PEERS® for Careers, rating the curriculum content an average score of 8.0 ($SD = 2.9$), on a scale from 0 (not at all helpful) to 10 (very helpful). Participants also found career coaches quite helpful in their internship/employment pursuits, rating the inclusion of this component an 8.4 ($SD = 2.94$). All twenty individual lessons were perceived as highly helpful, with no lesson receiving an average rating below 8 out of 10.

Participants rank-ordered the lessons based on helpfulness of content. When analyzing rank-order responses, a non-parametric Friedman test was significant, $\chi^2(16) = 48.7, p < .001$, suggesting shared priorities and perceptions of helpfulness among participating adults. On average, results indicated that lessons related to gaining internships/employment were ranked as most helpful, with the top three skill areas being interviewing, choosing a career, and resume development. Participants then valued lessons related to workplace communication, such as conversational skills and electronic communication, and navigating common issues while employed (e.g., disclosing diagnoses, asking for accommodations, handling stress, organizational skills, understanding workplace culture). Participants ranked higher-order social skills, such as humor, handling disagreements, and responding to workplace bullying, as least important.

Participants expressed a preference for extending the length of the program and reducing the frequency of sessions to once per week rather than twice per week. This preference was echoed in multiple qualitative feedback forms that alluded to a desire for more time to complete the program (e.g., “slower pace,” “additional weeks,” “more time to practice”).

4. Discussion

In sum, results indicate that PEERS® for Careers shows promise as a comprehensive college to career intervention to address the multi-faceted needs of autistic individuals in the workplace. Overall, participants were highly satisfied with the program and content. Young autistic adults were able to learn employment-related social skills. Further, even following a time-limited 10-week intervention, preliminary results show some benefits to vocational outcomes, such as increased engagement in employment-related and networking activities, as well as significant enhancements in subjective feelings of preparedness for employment. The lack of improvements in autism features on the SRS-2 may be due to the brief nature of the intervention. It is also possible that use of self-report on the SRS-2 was impacted by participants’ insight into their own symptoms or the measure’s susceptibility to capturing mental health symptoms (South et al., 2017).

In the current pilot implementation, autistic young adults identified skills related to obtaining internships/employment as most helpful (e.g., finding, applying, resume writing, interviewing). This was consistent with the focus group data collected to inform curriculum development. Given that most participants were not engaged in employment-related activities when first enrolled, this may be representative of their most imminent need. It is possible that once hired, the priorities of autistic adults may shift to skills more relevant to maintaining internships/employment and thriving in the workplace.

The current pilot was limited by its small sample size, lack of control group, lack of detailed information about employment characteristics (e.g., number of hours per week worked, type of employment, job title/company), lack of information on other services
received, and use of self-report measures only. To address these limitations, adaptations to the intervention are currently being tested in a randomized controlled trial using a sequential multiple assignment randomized trial (SMART) design for the purpose of strengthening methodology, increasing acceptability, maximizing cost-effectiveness, and enhancing impact. These adaptations include changing the format of the program as recommended by pilot participants (e.g., reducing to 1 session per week, extending length of program to 20 weeks), obtaining informant report and behavioral observational measures, increasing sample size, quantifying the added benefit of career coach involvement through a comparison group without career coaches, recording detailed information about employment outcomes, and including a specific internship/employment phase after the 20-week didactic portion of the program. Further, PEERS® for Careers is also building partnerships with community stakeholders and employers to highlight the talents and benefits of hiring autistic young adults. We are also planning to provide employer supports and psychoeducation in hopes of decreasing stigma and further reducing barriers to employment for autistic individuals.

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Research Ethics and Consent

All procedures were approved by the UCLA Institutional Review Board. All participants completed an informed consent process and provided written consent to all study procedures.

Conflicts of interest

The authors have no financial interests or non-financial interests to disclose.

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