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Academic skills of chronically unemployed drug-addicted adults

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Abstract

BACKGROUND—The strong association between unemployment and drug addiction suggests that employment interventions are an important and needed focus of drug-addiction treatment. The increasing necessity of possessing basic academic skills to function in the workplace may require that some individuals receive educational training along with vocational training.

OBJECTIVE—This study investigated the academic skills of drug-addicted and chronically-unemployed adults ($N = 559$) who were enrolled in one of six studies conducted at the Center for Learning and Health in Baltimore, MD.

METHODS—Upon study enrollment, academic skills in math, spelling, and reading were examined using the Wide Range Achievement Test (WRAT-3 or WRAT-4) and educational history was examined using the Addiction Severity Index–Lite.

RESULTS—Although participants completed an average of 11 years of education, actual academic skill level was at or below the seventh grade level for 81% of participants in math, 61% in spelling, and 43% in reading, and most participants were classified as Low Average or below based on age group norms. Despite the fact that participants in this analysis were studied across several years and were from diverse populations, rates of high school completion and academic skill levels were remarkably similar.

CONCLUSIONS—Programs designed to improve the long-term employment status of drug-addicted individuals may benefit from the inclusion of basic adult education; future research on the topic is needed. Although establishing basic skills does not directly address chronic unemployment, it may help individuals obtain the jobs they desire and function effectively in those jobs.

Keywords

Academic skills; vocational training; employment; education; poverty; drug addiction; Therapeutic Workplace

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Declarations of interest

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1. Introduction

Employment is recognized as an important factor in the treatment of drug addiction. Individuals who are unemployed have higher rates of substance abuse than those who are regularly employed, unemployment is common among individuals in substance abuse treatment, and poorer treatment outcomes (e.g., treatment attrition, more drug use during treatment, higher rates of relapse) are associated with unemployment (Ginexi, Foss, & Scott, 2003; Kidorf, Stitzer, Brooner, & Goldberg, 1994; Platt, 1995; Sterling et al., 2001). Employment is frequently cited as a goal of drug-addiction treatment as many clinicians believe it plays a vital role in recovery (Magura, 2003; Magura, Staines, Blankertz, & Madison, 2004). However, standard drug-addiction treatments rarely result in increased rates of employment (Magura et al., 2004; Hubbard, Craddock, & Anderson, 2003; Schildhaus, Gerstein, Brittingham, Cerbone, & Dugoni, 2000). Providing employment interventions in conjunction with drug-addiction treatment may be necessary to promote job-seeking, employment, and retention (Magura, 2003).

Existing employment interventions can be broadly separated into two main categories, “quick-entry” and “intensive education and training.” The quick-entry approach emphasizes job-search, job-interview skills, and quick entry into the job market, as participants are encouraged to seek jobs that match their current skill level. Although quick-entry programs have had some success in placing individuals in jobs, many do not benefit from these interventions (Hamilton et al., 2001). For example, the NIDA Clinical Trials Network conducted a randomized trial comparing a quick-entry program for drug-addicted adults called the Job Seekers’ Workshop to a standard care group. The Job Seekers’ Workshop participants and standard care participants had low and similar rates of employment at 12- (20% and 24%, respectively, were employed) and 24-week (31% and 32%, respectively) follow-ups (Svikis et al., 2012). A potential reason for the limited success of quick-entry programs may be because of an incongruity between job interests and skills of the jobseekers. Silverman, Chutuape, Sviki, Bigelow, & Stitzer (1995), for example, examined the occupational interests and academic skills of 50 drug-addicted women and found that most participants desired jobs that were beyond their education and training.

The intensive education and training (also known as “human capital development”) approach focuses on the development of academic and job-related skills needed to obtain higher-paying jobs. These may include basic academic skills training, General Education Development (GED) test preparation, vocational training, or a combination (Hamilton et al., 2001). Intensive education and training programs appear promising. In a randomized controlled study of “education-focused” programs for adult welfare recipients, secondary analyses showed that participants who were consistently engaged in the educational programs showed improvements in basic literacy and math skills, increased attainment of GEDs, and increased employment earnings (Bos, Scrivener, Snipes, & Hamilton, 2002; Hamilton, 2002). Intensive education and training approaches could be an ideal means to improve the lives of poorly educated and low-income populations, since increasing education appears to increase income. Data from the U.S. Census Bureau shows that lifetime income increases progressively as adults achieve higher levels of education (Bauman & Ryan, 2001; Day & Newburger, 2002). Indeed, education has been shown to be strongly

correlated with employment earnings and status (Psacharopoulos, 1994; Psacharopoulos & Patrinos, 2004); educated individuals earn higher wages and experience less unemployment than their less-educated counterparts. In an effort to use resources efficiently, there is a pressing need to determine who would benefit most from employment interventions that incorporate adult education programs (Hamilton et al., 2002).

The present analysis was conducted to assess the educational and academic skill levels of drug-addicted individuals who have a history of chronic unemployment, and determine the potential utility of including adult education programs in the context of substance abuse treatment. Data were from participants enrolled in an employment-based treatment intervention for drug addiction and unemployment called the therapeutic workplace. The therapeutic workplace is part of a larger family of voucher-based reinforcement interventions that have been used effectively in the treatment of drug addiction (Higgins & Silverman, 2008). Specifically, participants enrolled in the therapeutic workplace are invited to work for 4 hours every weekday for 6 months or more and are paid about \$10 per hour for working. The therapeutic workplace arranges employment-based reinforcement contingencies in which participants are required to engage in target behaviors (e.g., drug abstinence or medication adherence) to gain access to the workplace and maintain maximum pay. To assess skill levels upon entry into the workplace program, participants completed the Wide Range Achievement Test (WRAT-3 or WRAT-4; Wilkinson, 1993), a widely used instrument that assesses achievement in reading, spelling, and math. The present analysis presents results from the WRAT assessment for several drug-addicted groups that were enrolled in one of six different randomized controlled clinical trials evaluating the therapeutic workplace in the treatment of drug addiction. The trials were conducted between February 2001 and September 2009 and included homeless individuals with alcohol dependency, patients enrolled in methadone treatment who continued to use opiates and cocaine, and opioid-dependent injection drug users.

2. Method

2.1. Study participants and setting

The therapeutic workplace research was conducted in the Center for Learning and Health, a treatment-research unit located at the Johns Hopkins Bayview Medical Center (Baltimore, MD). The Center for Learning and Health is dedicated to addressing the interrelated problems of addiction, unemployment, and poverty. In all studies, participants were invited to attend the workplace where they could work and earn wages in vouchers exchangeable for goods and services.

Participants for the present analysis ($N = 559$) were enrolled in one of six clinical trials conducted at the Center for Learning and Health. The main results of the clinical trials have been presented elsewhere (DeFulio et al., 2012; Donlin, Knealing, Needham, Wong, & Silverman, 2008; Dunn et al., 2013; Everly et al., 2011; Knealing, Wong, Diemer, Hampton, & Silverman, 2006; Koffarnus et al., 2011). While the inclusion criteria varied across the six studies, all participants were at least 18 years old, met DSM-IV criteria for opiate, cocaine, or alcohol dependence or provided a drug positive urine, and were unemployed (i.e., reported no work in the past 30 days and earning <\$200 in taxable income per month).

Additional inclusion and exclusion criteria have been reported elsewhere (DeFulio et al., 2012; Donlin et al., 2008; Dunn et al., 2013; Everly et al., 2011; Knealing et al., 2006; Koffarnus et al., 2011).

2.2. Measures

2.2.1. Study and demographic characteristics—Demographic characteristics for participants in each of the studies were collected at intake using the Addiction Severity Index–Lite (ASI–Lite; McLellan et al., 1985). The ASI–Lite was used to evaluate drug use, educational, employment, family, medical, and legal histories. A summary of the demographic characteristics can be found in Table 1, along with characteristics of each study.

2.2.2. Wide range achievement test—Participants completed one of two parallel forms of the spelling, reading, and, in some cases, math subsections of the Wide Range Achievement Test (WRAT). Participants in the studies beginning before 2006 completed Version 3 of the WRAT whereas all other participants completed Version 4. In the spelling subsection, participants were asked to write single letters and words that were read aloud by the test administrator; items increased in difficulty as the test progressed. The test was discontinued after 10 consecutive spelling errors. In the reading subsection, participants were given cards with single letters or words. Participants were asked to read aloud the test items, beginning with the letters and progressing to increasingly more difficult words. This subset was discontinued after 10 consecutive reading errors. In the math subsection, participants were asked to complete written problems in addition, subtraction, multiplication, and division. Participants were given a maximum of 15 min to complete this portion of the test.

3. Results

Figure 1 provides a summary of the highest grade of education that participants completed. Approximately 60% of participants completed 12 or more years of education, indicating that a little over half of the participants had earned a high school diploma. About 34% of participants completed between nine to eleven years of education and a small percentage (6%) only completed eight or less years; about 40% of participants did not graduate from high school.

Figure 2 shows participant's estimated grade levels in reading, spelling, and math across the different study populations. A large percentage of participants were at or below the seventh grade level in academic achievement in reading, spelling, and math (approximately 43% of participants in reading, 61% in spelling, and 81% in math), and about 23% of participants were at or below the fourth grade level in these areas. Table 2 shows WRAT classifications of academic achievement levels based on standard scores. The national mean for the standard scores is set at 100 and the standard deviation is set at 15, the same metric as IQ tests (Wilkinson, 1993). Approximately 64% of participants in reading, 70% in spelling, and 76% in math were classified as Low Average or below, and about 19%, 24%, and 13% of participants, respectively, were classified as Deficient in these areas. Almost no participants were classified as above average (High Average, Superior, or Very Superior).

Independent-samples t-tests were conducted comparing grade levels of academic achievement in reading, spelling, and math among participants who did and did not graduate from high school. Participants who graduated from high school compared to those who did not had significantly higher estimated grade levels in reading ($M = 7.88$ versus 5.95 , respectively; $p < 0.001$), spelling ($M = 7.21$ versus 5.13 , respectively; $p < 0.001$), and math ($M = 6.60$ versus 4.94 , respectively; $p < 0.001$). While participants who graduated from high school had higher estimated grade levels across all three of the academic categories, mean grade equivalencies were still below the eighth grade level.

Spearman's correlation coefficients were calculated for educational and employment characteristics. The highest grade of education that participants completed was significantly correlated with the estimated grade levels in reading ($P = 0.359$, $p < 0.001$), spelling ($P = 0.399$, $p < 0.001$), and math ($P = 0.386$, $p < 0.001$). The highest grade of education completed was not significantly correlated with being usually unemployed in the past three years ($P = -0.041$, $p = 0.341$), but was significantly correlated with longest durations of full-time employment ($P = 0.311$, $p < 0.001$). Being usually unemployed in the past three years was not significantly correlated with estimated grade levels in reading ($P = -0.044$, $p = 0.314$), spelling ($P = -0.041$, $p = 0.354$), and math ($P = 0.059$, $p = 0.373$). Longest durations of full-time employment was not significantly correlated with estimated grade levels in reading ($P = 0.067$, $p = 0.127$) and spelling ($P = 0.018$, $p = 0.675$), but was significantly correlated with math ($P = 0.138$, $p = 0.036$).

4. Discussion

The present analysis provides information on the academic skills of chronically unemployed adults with histories of drug addiction collected between February 2001 and September 2009. The academic achievement tests indicated that most of the participants lacked basic skills in reading, spelling, and math. Even though a little more than half of the participants completed high school, the majority were at or below the seventh grade level of academic achievement. Furthermore, most participants had academic achievement levels that were below average compared to other persons in their age group and almost no participants had academic achievement levels that were above average (Table 2). Despite the fact that participants in this analysis were studied across several years and were from diverse populations, they showed remarkably similar rates of high school completion (Fig. 1) and academic skill levels (Table 2 and Fig. 2). The strong positive correlation between education and employment status (Psacharopoulos, 1994; Psacharopoulos & Patrinos, 2004) suggests that teaching basic skills may be necessary to improve long-term employment status, and the present study shows that the large majority of unemployed drug-addicted individuals lack basic academic skills. Our finding that attainment of a high school diploma is associated with increased academic skill aligns well with data from the general population (e.g., Kutner et al., 2007), but our results may be unique in that the level of academic skill among those with a diploma was still remarkably low, with mean grade equivalencies in reading, spelling, and math at about the seventh grade level. Although establishing basic skills does not directly address chronic unemployment or drug addiction, it may help individuals obtain the jobs they desire and function effectively in those jobs, and thus may play a key role in addiction recovery.

While the present study focused on academic skill levels, drug-addicted individuals in exiting treatment face many additional barriers to employment. These include limited work skills and experience; lack of job search and interviewing skills; and employers' reluctance to hire persons with drug addiction and criminal histories (Atkinson, Lee, Dayton-Shotts, & French, 2001; Lidz, Sorrentino, Robinson, & Bunce, 2004; Meara, 2006; Sigurdsson, Ring, O'Reilly, & Silverman, 2012; Wong & Silverman, 2007; Zanis, Coviello, Alterman, & Appling, 2001). Any successful employment intervention will necessarily have to tackle the barriers to employment that a jobseeker encounters.

Despite the potential benefits of employment programs that incorporate basic-skills training, educational programs often fail to consistently engage participants. In a large-scale randomized controlled study that evaluated "education-focused" programs for adult welfare recipients (Hamilton et al., 2001), most participants did not attend the education and training programs long enough to reap their potential benefits (Bos et al., 2002). In the general population, few adults who do not have a high school diploma or equivalent participate in adult education. The U.S. Department of Education, National Center for Education Statistics (2007) estimated that among adults over the age of 16 who did not have a high school diploma or equivalent in 2005, only 1% participated in degree or diploma programs, and only 4% participated in work-related courses. These findings suggest that a critical component of any employment intervention will be procedures to reliably engage individuals and to establish targeted skills. Future research will have to determine if adult education that effectively retains participants in training and establishes academic and job skills can improve employment outcomes.

The strong association between unemployment and drug addiction suggests that employment interventions are an important and needed component of drug-addiction treatment. However, the application of employment interventions to drug-addicted individuals is likely to be challenging given the general difficulties with retention in intensive adult education training programs (Bos et al., 2002; Hamilton, 2002), and the low level of academic skill in this population as documented in the present paper. Effective retention strategies and instructional tools tailored to low-skilled adult learners will be required to overcome these challenges. Some prior research has shown that incentives can be effective in maintaining attendance in training (Koffarnus et al., 2011; Silverman, Chutuape, Bigelow, & Stitzer, 1996) and promoting progress in training programs (Koffarnus, DeFulio, Sigurdsson, & Silverman, 2013; Koffarnus, Wong et al., 2013). Key topics for future research include incentives and supports for the dual targets of retention and academic success, and evaluations of instructional design approaches and delivery mechanisms for adult basic education programs. Such work could prove useful or even essential in the development of large-scale programs designed to simultaneously address poverty, unemployment, and drug addiction.

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Fig. 1.

The percentage of participants who completed 12 or more years of education (black bars), 9 to 11 years of education (striped bars), or 8 or less years of education (grey bars) across six different studies conducted at the Center for Learning and Health in Baltimore, MD.

Fig. 2. Wide Range Achievement Test (WRAT) reading (top panel), spelling, (middle panel), and math (bottom panel) levels across six different studies conducted at the Center for Learning and Health in Baltimore, MD. The filled circles show grade levels for individual participants and the grey, horizontal lines show group means.

Table 1

Study and participant characteristics

Characteristic	Knealing et al. (2006)	Donlin et al. (2008)	Koffarnus et al. (2011)	Everly et al. (2011)	DeFulio et al. (2012)	Dunn et al. (2013)	All Studies
Study Characteristics							
Years of enrollment	2001-2002	2003-2006	2001-2005	2006-2008	2008-2009	2006-2009	
Population	Cocaine dependent methadone patients	Cocaine dependent methadone patients	Homeless alcohol-dependent adults	Opioid dependent adults	Opioid dependent adults	Opioid dependent injection drug users	
Target of the intervention	Opiate and cocaine abstinence	Opiate and cocaine abstinence	Alcohol abstinence	Extended-release naltrexone adherence	Extended-release naltrexone adherence	Oral naltrexone adherence	
Participant Characteristics							
Age, mean (SD)	37 (6)	43 (6)	43 (8)	42 (6)	42 (9)	43 (9)	42 (8)
Gender							
Female, %	89	78	19	45	43	41	49
Race							
Black, %	85	94	48	92	89	75	77
White, %	15	6	50	8	11	22	22
Other, %	0	0	2	0	0	3	1
Usually unemployed past 3 years, %	57	77	52	55	65	63	63
Duration of longest job, years, mean (SD)	4 (3)	6 (6)	6 (6)	4 (5)	4 (5)	4 (5)	5 (5)
Used in past 30 days, %							
Cocaine	100	100	45	80	73	96	82
Heroin	72	57	23	100	100	100	71
Alcohol	64	59	100	63	61	58	69

Table 2

Participants in each of the Wide Range Achievement Test (WRAT) classifications of academic achievement in reading, spelling, and math

WRAT classification	Standard score ^a (Range)	Participants (%)		
		Reading (<i>n</i> = 528)	Spelling (<i>n</i> = 528)	Math (<i>n</i> = 233)
Very superior	130	0.0	0.0	0.0
Superior	120-129	0.0	0.0	0.4
High average	110-119	1.3	1.1	0.0
Average	90-109	34.3	29.2	23.2
Low average	80-89	25.8	25.4	33.9
Borderline	70-79	19.5	20.6	29.6
Deficient	69	19.1	23.7	12.9

Note. Data that were missing were excluded from the analysis.

^aStandard scores are based on age group norms.