Adults with Untreated Mood Disorders Have Neurocognitive Deficits that can Impact Workplace Performance

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Introduction

Nearly 1 out of 10 Canadian adults will experience a depressive illness in their lifetime.

It is estimated that as many as 44% of adults with untreated depression experienced work-related problems, including lost productivity, absenteeism, and impaired work performance.

Adults with depression typically perceive problems with concentration, memory, problem solving, and thinking skills.

A meta-analysis by Zakzanis, Leach, and Kaplan (1998) identified reductions in memory, psychomotor speed, and sustained attention as the most prominent neurocognitive features of depression.

Neurocognitive deficits can have a direct impact on workplace performance.

Purpose: To illustrate a methodology for identifying neurocognitive deficits in adults with untreated depression using a 30-minute computerized neuropsychological battery.

Participants

186 adults with depression as their primary diagnosis.

Average age = 32.7 years (SD=16.3); Average education = 11.4 years (SD=5.6); 31.5% male; and 84.9% Caucasian.

Occupations and employment status: Student (30.6%), Professional/Technical (22.6%), Not working/Retired (8.1%), Disabled (8.1%), Managerial/Office (6.5%), Clerical/Sales (4.3%), Skilled Labor (4.3%), and Unskilled Labor (0.5%). Occupation was missing for 15.1% of the sample.

All patients were medication-free at the time of their evaluation.

Measure

CNS Vital Signs is a computerized neruocognitive test battery that takes 30-40 minutes to administer.

CNS Vital Signs is comprised of seven common neuropsychological measures, including verbal and visual memory, finger tapping, symbol digit coding, the Stroop test, a shifting attention test, and a continuous performance test.

The battery generates 15 primary scores, which are used to calculate 5 domain scores (Memory, Psychomotor Speed, Reaction Time, Cognitive Flexibility, and Complex Attention) and a summary score (Neurocognition Index).

Analyses

Analysis of the CNS Vital Signs test results involved examining the base rates of low domain scores across the three groups (i.e., neuropsychological profile analysis.

Calculations for the base rates of low scores involve simultaneously examining the five domain scores, rather than performance on each domain in isolation.

The base rates of low domain scores were calculated by using four cutoff scores that might be routinely used in clinical practice, including: (a) more than 1 standard deviation (SD) below the mean (i.e., < 85), (b) below the 10th percentile (i.e., < 81), (c) at or below the 5th percentile (i.e., ≤ 76), and (d) more than 2 SDs below the mean (i.e., < 70).

Results

Mean performance across all domains, compared to the population mean of 100, was as follows: Memory = 87.4, SD = 25.5; Psychomotor Speed = 88.5, SD = 22.8; Reaction Time = 96.0, SD = 31.4; Cognitive Flexibility = 89.7, SD = 26.4; Complex Attention = 84.2, SD = 32.0.

The base rates of low scores, when *simultaneously* examining all five domains, are presented in Table 1.

The majority of adults with untreated depression (64.5%) had at least one low domain score (i.e., more than 1 SD below the mean).

Based on previous research (e.g., Brooks et al., 2007; Iverson et al., 2007), it has been determined that having 2 or more domain scores at or below the 5th percentile likely represents cognitive impairment.

When using two or more scores below the 5th percentile as the cutoff for frank neurocognitive impairment, 31.2% of the adults with untreated depression scored in this range.

Table 1. Base rates of low CNS Vital Signs domain scores in adults with untreated depression.

Number of Low Scores	< 1 SD		< 10th %ile		≤ 5th %ile		< 2 SDs		Number of Low Scores
	%	C%	%	C%	%	C%	%	C%	
5	7.5	7.5	5.4	5.4	4.3	4.3	3.2	3.2	**5**
4	10.2	17.7	9.7	15.1	9.1	13.4	5.4	8.6	**4**
3	12.4	30.1	9.1	24.2	5.4	18.8	6.5	15.1	**3**
2	15.6	45.7	13.4	37.6	12.4	31.2	9.1	24.2	**2**
1	18.8	64.5	19.9	57.5	20.4	51.6	17.2	41.4	**1**
0	35.5	100	42.5	100	48.4	100	58.6	100	**0**

Note: There are slight variations due to rounding. Base rates are based on the simultaneous analysis of the 5 domain scores, including Memory, Psychomotor Speed, Reaction Time, Cognitive Flexibility, and Complex Attention.

Conclusions

Problems with memory, psychomotor speed, complex attention, and cognitive flexibility were relatively common.

Cognitive deficits, which are found in 31.2% of the adults with depression, can have a negative impact on workplace functioning.

It is possible that those depressed workers with cognitive impairment are more likely to have problems performing their expected job duties.

There is some research suggesting that treatment of depression results in better work-related outcomes, which in turn can result in less financial burden on employers.

The subsample of adults with cognitive impairment can be easily identified (i.e., using a quick computerized battery), treated, and their cognition can be monitored serially.

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