Prevalence and Correlates of Cognitive Impairment in Depression: Findings from the Texas Resilience Against Depression Study

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1. Introduction

- Cognitive impairment (CI) is associated with worse clinical and functional outcomes in depression.
- Typical cognitive performance is –0.5 to –1 SD below healthy controls across cognitive domains.
- Estimates of CI in depression range from 30-60%, but prior studies have been limited by sample size or do not take premorbid cognitive function into consideration.
- The purpose of the present study is to determine the prevalence of CI in depression as well as clinical and functional outcomes of CI.

2. Study Design

- Data was from the Dallas 2K (D2K) sub-study from the Texas Resilience Against Depression (T-RAD) study, a large prospective study of individuals with current or past depression or bipolar disorder.
- Cognition was assessed with the NIH Toolbox Cognitive Battery (NIHTB-CB); patient- and clinician-rated measures of symptom severity and function were also assessed.
- The first visit with cognition was used as the baseline visit; analyses focused on outcomes one-year post-baseline.
- Participants were included in analyses if they had a primary diagnosis of depression (per MINI) and were ≥ 18 years old at the time of the assessment.

3. Data Analysis

- Participants were classified as having CI if they had ≥ 2 NIHTB-CB scores below their estimated premorbid function measured by the NIHTB-CB Crystallized Composite using demographically-corrected norms (Holdnack et al., 2017).
- Linear mixed models were used to test group differences and differences in rates of change over time between groups. Multiple imputation (M=140 per group) was used to account for missing observations.
- Reliable Change Indices were used to assess the stability of CI over time (Karr et al., 2024).

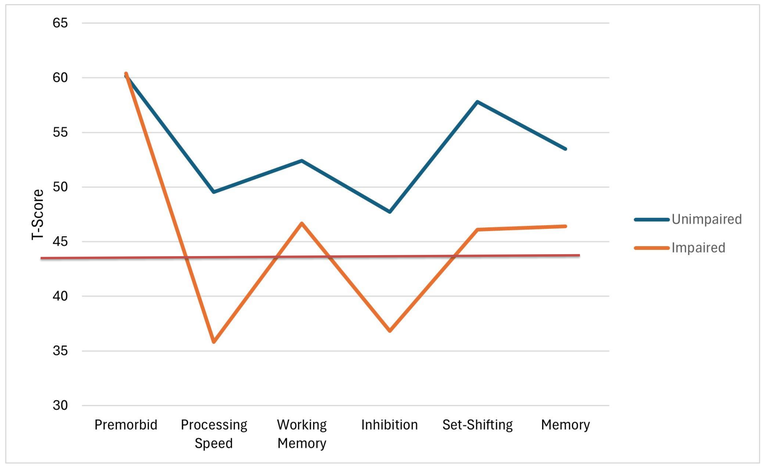
Premorbid Function Range	Cognitive Impairment Criteria
T ≥ 58	Two or more tests with T ≤ 43
T = 50 to 57	Two or more tests with T ≤ 40
T = 43-49	Two or more tests with T ≤ 37
T < 43	Two or more tests with T ≤ 34

T-Scores have a Mean of 50 and Standard Deviation (SD) of 10. Impairment is therefore classified using roughly 1-1.5 SD from an individual's estimated premorbid function. Criteria used was developed by Holdnack et al. (2017)

4. Prevalence of Cognitive Impairment (N=391)

Age	N	Impaired %
18-39	150	51%
40-59	159	53%
60+	82	50%
Female	139	49%
White vs. Non-White	153	50%
Total	**201**	**51%**

5. Profile of Performance on NIHTB-CB



Red line represents average performance; although performance on non-premorbid tests are around the average range, they reflect 1-2 standard deviations below their premorbid estimate.

6. Group Comparisons*

Variable	Group	Time	Group x Time
Clinical			
PHQ-9 (Depression)	0.75 (0.61)	**-1.90 (0.51)**	-0.07 (0.71)
GAD-7 (Anxiety)	0.74 (0.54)	**-2.18 (0.48)**	0.56 (0.67)
DARS (Anhedonia)†	**3.73 (1.18)**	1.03 (1.10)	2.33 (1.56)
CHRT (Suicidality)	**2.67 (1.12)**	**-3.47 (0.94)**	-2.14 (1.36)
BASC (Cognition)	-3.23 (1.72)	2.00 (1.40)	0.38 (2.12)
Functioning			
WHOQOL Overall	**-6.23 (2.20)**	**4.93 (1.76)**	2.23 (2.46)
WHOQOL Physical	**-6.00 (1.92)**	2.66 (1.48)	2.44 (2.08)
WHOQOL Psychological	**-4.08 (1.90)**	**4.43 (1.47)**	2.62 (2.03)
WHOQOL Environmental	**-3.70 (1.78)**	**3.05 (1.40)**	2.21 (1.99)
WHOQOL Social	-3.89 (2.20)	**4.51 (1.95)**	1.46 (2.76)
WPAI Activity Impairment	**7.42 (3.26)**	-0.56 (2.79)	-4.21 (4.08)
WSAS	2.07 (1.05)	**-2.94 (0.88)**	-0.63 (1.27)

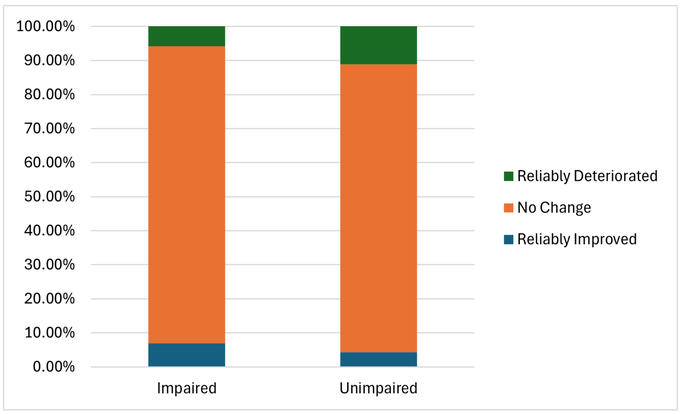
*Values provided are parameter estimates and standard errors. Bolded values indicate statistically significant effects at a two-sided P-Value < 0.05; bolded values in red are statistically significant after FDR correction. †Higher scores represent more severe anhedonia.

7. Cognitive Impairment by Premorbid Cognition

Premorbid Function	Unimpaired	Impaired
T ≥ 58	100 (54.64%)	129 (66.15%)
T = 50 to 57	52 (28.42%)	39 (20.00%)
T = 43-49	21 (11.48%)	21 (10.77%)
T < 43	10 (5.46%)	6 (3.08%)
Total	**183 (48.41%)**	**195 (51.59%)**

Fisher's Exact P = 0.105

8. Stability of Cognitive Status Over Time



Plot shows the percentage of subjects whose cognition improved, declined, or remained unchanged from their initial cognitive assessment.

9. Conclusions

- CI is present in approximately 50% of the depressed population.
- CI in depression does not vary based on age or premorbid cognitive function.
- CI is a highly stable phenotype.
- Without taking premorbid cognition into consideration (as is the case for most studies), cognitive performance appears to be in the mildly impaired range, but is actually more profoundly impaired compared to premorbid levels.
- Individuals with CI and depression are:
  - No more depressed or anxious than non-CI depressed
  - More likely to report greater anhedonia and suicidality
  - More likely to report impairments in activities
  - More likely to report worse quality of life

10. Acknowledgments

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