RANDOMIZED CONTROLLED TRIAL OF GROUP DBT SKILLS AND MINDFULNESS TRAINING FOR ADHD AMONG COLLEGE STUDENTS

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INTRODUCTION
DIAGNOSTIC CRITERIA

- ADHD behavioral criteria
  - Inattention (poor attention regulation)
  - Hyperactivity/impulsivity
- Childhood onset
- Functional impairment

DEVELOPMENTAL CONTEXT
SELF-REGULATION

- Self-regulation in emerging adults (18-24)
  - Ongoing myelination of DLPFC until ~25
  - Socio-emotional vulnerability
  - “Double-deficit” in self-regulation

PREVALENCE

Children
~8%

College & Adult
~5%

DEVELOPMENTAL CONTEXT
SELF-REGULATION

Fig. 2. Risk taking of adolescents, young adults, and adults during a video driving game, when playing alone and when playing with friends. Adapted from Gardner & Steinberg (2005).
INTRODUCTION
ENVIRONMENTAL CONTEXT OF COLLEGE

Self-regulation demands
External supports

INTRODUCTION
FUNCTIONAL IMPAIRMENT IN COLLEGE

Functional Impairment

INTRODUCTION
FUNCTIONAL IMPAIRMENT IN COLLEGE

- Academic
- Psychological
- Social
- Occupational
- Driving

INTRODUCTION
ADHD TREATMENT RESEARCH

Children
(through emerging adults)
Adolescents
Adults

- Medication with adults
  - Reduces core symptoms & impairment
- Medication with college students
  - One brief controlled trial (Vyvanse)
- Concerns regarding medication:
  - Nonresponse and residual impairment
  - Medication adherence

INTRODUCTION
TREATMENT RESEARCH — COLLEGE

- Medication with adults
- Medication with college students
- Concerns regarding medication:
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INTRODUCTION
TREATMENT RESEARCH — ADULTS

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n.e. Barkley et al., 2012; Maen et al., 2008; Frazier et al., 2007; Rooney et al., 2001; Shifrin et al., 2010

DuPaul et al., 2012; Moin et al., 2006; Balter et al., 2006; Whole et al., 1984, 1985

DuPaul et al., 2012; Salam et al., 2010; Roberts et al., 2010; Tang et al., 2007; Zylowska et al., 2009
INTRODUCTION

SPECIFIC AIMS

- Treatment development approach:
  - Adapt intervention principles that show efficacy with adults and adolescents with ADHD...
  - ... to the developmental and environmental context of college...
  - ... and see if it works.

METHOD

RECRUITMENT

- University of Washington, Seattle Pacific University, and Seattle University
- Offices providing student services
  - Student disability services offices (e.g., DRS)
  - Student health centers (e.g., Hall Health)
  - Counseling centers
- Email, flyers, brochures

STUDY DESIGN

- Initial screening
- Diagnostic evaluation
- Randomization
- Treatment Phase
- Follow-up Phase
- Pre-Treatment Assessment
- Treatment Assessment
- Post-Treatment Assessment
- Follow-up Assessment

METHOD

INCLUSION CRITERIA

- Currently enrolled undergraduate
- Age 18-24
- Meet revised DSM-IV-TR criteria for ADHD (PI or combined type)
  - At least 4 inattentive symptoms
  - Functional impairment (2+ domains)
  - Childhood onset (by age 12)
- Willingness to be randomly assigned and participate in either treatment

METHOD

PARTICIPANT FLOW

- 73 Assessed for eligibility
- 38 Excluded
  - 11 Age ≥ 25 years
  - 6 History of PDD or Bipolar Disorder
  - 4 Did not meet criteria for ADHD
  - 3 Current major depressive episode
  - 2 Recent medication change
  - 2 Not currently enrolled undergraduate
  - 10 Declined to participate
- 35 Randomized
  - 19 Randomized to group skills training
    - 17 Received intervention
    - 2 Could not participate due to scheduling constraints
  - 16 Randomized to skills handouts
    - 16 Received intervention

TREATMENTS: GROUP CBT SKILLS TRAINING

- Group intro & Mindfulness
  - Organization & Planning
  - Environment
  - Managing daily life rhythms
  - Emotion regulation
  - Skills strengthening
- DBT skills training format
- Group leader & co-leader
- Supervisor & DBT consultation team

Barkley, 2011
**METHOD**

**TREATMENTS: GROUP CBT SKILLS TRAINING**

- Session format:
  - 10 Opening mindfulness practice & discussion
  - 5 Skills teaching review
  - 30 Homework review with diary card
  - 5 Midpoint mindfulness practice
  - 35 New skills teaching & practice
  - 3 Assign homework practice
  - 2 Closing mindfulness

- Coaching calls:
  - Motivation, skills generalization, feedback

**METHOD**

**TREATMENTS: SKILLS HANDOUTS**

- Self-guided skills handouts
  - Psychoeducation
  - Organization & planning
  - Structuring environment
  - Time management
  - Emotion regulation & stress management

**RESULTS & DISCUSSION**

**SAMPLE CHARACTERISTICS**

- **N** = 33
- Age: M = 21.3 (range 18-24)
- 42% female
- Race:
  - 58% White, 15% Latino, 6% Asian, 3% Black, 18% Multi-racial/Other
- 73% public university
- Verbal IQ: M = 110 (range: 82-147)

**RESULTS & DISCUSSION**

**SAMPLE CHARACTERISTICS**

- ADHD subtype
  - 30% ADHD inattentive (revised)
  - 55% ADHD inattentive (full DSM-IV-TR)
  - 15% ADHD combined (full DSM-IV-TR)

- Psychiatric medication status
  - 64% stimulant only
  - 9% stimulant + SSRI
  - 3% SSRI only
  - 24% no medication

**#1: EFFICACY—ADHD SYMPTOMS**

ADHD Inattentive Symptoms

![Graph showing changes in ADHD inattentive symptoms over time with CBT and handouts compared to baseline, post-treatment, and follow-up phases.](image)

- **RM ANOVA:**
  - F(2, 49) = 3.1, p = .05, partial \( \eta^2 \) = .09
  - post: F(1, 30) = 2.6, p = .1, \( \eta^2 \) = .06
  - follow-up: F(1, 30) = 3.6, p = .05, \( \eta^2 \) = .11
#1: Efficacy—ADHD Symptoms

**Total ADHD Symptoms**

- **RM ANOVA:** Post: $F(2, 62) = 3.18, p = .053$, partial $\eta^2 = .093$
- **Follow-up:** Post: $F(1, 31) = 2.41, p = .13, d = .47$
- Follow-up: $F(1, 31) = 6.09, p = .019, d = .71$

#1: Efficacy—Executive Functioning

**Executive Functioning Symptoms**

- **RM ANOVA:** Post: $F(2, 62) = 5.46, p = .007$, partial $\eta^2 = .150$
- **Follow-up:** Post: $F(1, 31) = 9.85, p = .004, d = .94$
- Follow-up: $F(1, 31) = 7.61, p = .01, d = .81$

#1: Efficacy—Quality of Life

**Quality of Life**

- **RM ANOVA:** Post: $F(2, 62) = 3.47, p = .038$, partial $\eta^2 = .101$
- **Follow-up:** Post: $F(1, 31) = 6.69, p = .015, d = .90$
- Follow-up: $F(1, 31) = .42, p = .52, d = .21$

#1: Efficacy—Functional Impairment

**Functional Impairment**

- **RM ANOVA:** Post: $F(2, 62) = 3.48, p = .049$, partial $\eta^2 = .101$
- **Follow-up:** Post: $F(1, 31) = 6.69, p = .015, d = .90$
- Follow-up: $F(1, 31) = .42, p = .52, d = .21$

#1: Efficacy—Treatment Response

**Treatment Response Rates**

- **Post-Treatment:** ADHD Inatt: $\chi^2(1) = 2.44, p = .12$
  Total ADHD: $\chi^2(1) = 3.48, p = .069$
  Exec. Func.: $\chi^2(1) = 7.13, p = .008$
- **Follow-up:** ADHD Inatt: $\chi^2(1) = 5.24, p = .02$
  Total ADHD: $\chi^2(1) = 4.16, p = .041$
  Exec. Func.: $\chi^2(1) = 3.36, p = .049$

#1: Efficacy—Treatment Recovery

**Treatment Recovery Rates**

- **Post-Treatment:** ADHD Inatt: $\chi^2(1) = 2.31, p = .11$
  Total ADHD: $\chi^2(1) = 7.04, p = .006$
  Exec. Func.: $\chi^2(1) = 8.51, p = .004$
- **Follow-up:** ADHD Inatt: $\chi^2(1) = 2.70, p = .10$
  Total ADHD: $\chi^2(1) = 6.02, p = .009$
  Exec. Func.: $\chi^2(1) = 1.06, p = .30$
#1: Efficacy—Neuropsych. Performance

**Sustained Attention**

- **RM ANOVA:** **F(2, 60) = 3.09, p = .066, partial η² = .093**
- **Post:** **F(1, 30) = 3.69, p = .071, d = .74**
- **Follow-up:** **F(1, 30) = 4.30, p = .048, d = .74**

**#1: Efficacy—Mindfulness**

**Mindfulness**

- **RM ANOVA:** **F(2, 60) = 4.15, p = .031, partial η² = .118**
- **Post:** **F(1, 31) = 4.28, p = .047, d = .72**
- **Follow-up:** **F(1, 31) = 5.70, p = .023, d = .75**

## RESULTS & DISCUSSION

### Specific Aim #1: Efficacy

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*Adjusted to individual intervention time

source: Philipsen et al., 2007; Safren et al., 2010; Solanto et al., 2010; Zylowska et al., 2008

### Specific Aim #2: Acceptability

**Acceptability Score**

- **Group sessions attended:** **88%**
- **Group treatment dropout:** **6%**

**Skills handouts feedback:**

- “The mindfulness technique was priceless.”
- “The group activities and the weekly check-ins [helped]. Also the weekly calls helped a lot.”
- “Doing things mindfully has significantly improved my ability to focus during these activities and also in other related situations. Also, breaking down some of my issues and receiving support was helpful, as was public accountability.”
- “Definitely could have been at least a couple weeks longer.”
- “I just want to say thanks so much to Andrew, Lyndsey, and the rest of my group for being so fantastic and supportive. You are my ADHD family!”

**Skills handouts feedback:**

- “It was very informative. It helped me develop ways to manage.”
- “A pamphlet won't do anybody with ADHD good : /”
RESULTS & DISCUSSION

SPECIFIC AIM #4: FEASIBILITY

- Initial feasibility estimate
  - 6 participants per group
  - 3 hours weekly skills leader time vs. 6 hours weekly individual therapist time
  - 50% resource load vs. individual CBT

RESULTS & DISCUSSION

STRENGTHS

- Internal validity
  - Randomized design
  - Blinded assessment
  - Intent-to-treat analyses
  - Low attrition rate (3%)
  - Conservative approach to missing data

- External validity
  - Treatment-seeking population
  - Diverse sample (e.g., race, college, ADHD severity)

RESULTS & DISCUSSION

LIMITATIONS

- Small sample size
- Lack of control for:
  - Nonspecific factors of psychotherapy
  - Therapist effects
- No semi-structured assessment with clinician global rating
- Inclusion of participants meeting revised DSM-IV-TR criteria

RESULTS & DISCUSSION

FUTURE DIRECTIONS

- Stage II efficacy trial (single- or multi-site)
  - Powered for moderate effect sizes
  - Time-matched control
  - Larger group sizes
  - Therapist training
  - Broader assessment battery
- Component analysis

RESULTS & DISCUSSION

CONCLUSIONS

- Preliminary evidence of:
  - Efficacy
    - Executive functioning
    - Quality of Life
    - ADHD symptoms
    - Mindfulness
    - Sustained attention
    - *trend
    - *exploratory
  - Acceptability
  - Feasibility

- Support for larger randomized trial

ACKNOWLEDGMENTS

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