Acceptability of Mindfulness-Based Interventions for Substance Use Disorders

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Background - Substance Use Disorders (SUD)

- Affects over 20 million Americans
- Costs over $400 billion annually
- 40-60% relapse within one year post-treatment
- Treatment and relapse prevention programs are a high priority for NIH research

Mindfulness-Based Interventions

- Mindfulness-based interventions (MBIs) for SUD – 3rd wave of cognitive behavioral therapies

- MBIs have been developed for issues in which stress, emotional, or physical pain are concerns

- Essential core meditative practices
  - grounded in silence
  - stillness
  - self-inquiry
  - embodiment
  - emotional sensitivity
  - acceptance of emotional expression

Mindfulness-Based Model

Neural circuitry of addiction	Associated brain areas	Target in mindfulness intervention
Reward (craving & pleasure)	Medial PFC, anterior cingulate cortex, nucleus accumbens, amygdala, VTA	Increasing present moment awareness, sitting with discomfort
Learning & memory (habit)	Dorsolateral PFC, orbitofrontal cortex, dorsal striatum, amygdala, hippocampus, VTA	Reduced reactivity to drug cues, sitting with discomfort without going on autopilot
Motivation & drive	Orbitofrontal cortex, anterior cingulate cortex, dorsal striatum, VTA	Greater self-regulation, cultivating non-reactivity including reduced reactivity to drug cues, choice selection
Stress responses	HPA axis, amygdala and extra-hypothalmic CRF system	Increasing present moment awareness, sitting with discomfort, greater self-regulation, reduced reactivity to drug cues
Executive control	Ventromedial PFC, orbitofrontal cortex, dorsolateral PFC, anterior cingulate cortex	Greater self-regulation, enhanced attentional control, actively allowing discomfort via choice selection

Witkiewitz, Lustyk, & Bowen (2013)

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History of MBIs in the U.S.

- Mindfulness-Based Stress Reduction (MBSR)
  - Jon Kabat-Zinn in 1979
- University of Massachusetts Medical Center
- Popular among middle-class, educated, White Americans
- Often expensive
- Historically, not tested among minority populations

Acceptability

- Multifaceted construct reflects appropriateness, based on anticipated or experienced cognitive and emotional responses to the intervention

Significance of Acceptability

- More likely to adhere to and benefit from the intervention (Hommel et al., 2013)

- Facilitators are less likely to alter the intervention (Proctor et al., 2009)

- Growing priority in clinical research (Moore, et al., 2015)
  - Medical Research Council did not mention acceptability in 2000,
  - 2015, mentions acceptability 14 times without conceptual and operational definitions

- 43 systematic reviews of healthcare interventions, none mentioned an acceptability theory or framework (Sekhon, 2017)

Systematic Review

- Of 17 MBI for SUD studies, only 4 measured acceptability

- Acceptability Measures
  - Satisfaction
  - Practice
  - Follow-up retention rates
  - Attendance

- Always assessed after the intervention

- All concluded the intervention was acceptable

- None assessed variation in acceptability

Bautista, T., James, D. & Amaro, H. (2019). Acceptability of mindfulness-based intervention for substance use disorder: A systematic review. *Complementary Therapies in Clinical Practice,* 35, 201-207, doi: 10.1016/j.ctcp.2019.02.012.

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Issues found in the literature

- 6 studies used retention, attendance, or follow-rates to assess feasibility
  - Creates confusion in conceptual and operational definitions

- Issues using retention/completion/attendance
  - Inaccurate
    - Can complete without accepting
    - Can accept without completing

- Satisfaction and practice – more accurate

- Lack of assessment of initial acceptability

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Issues continued…

- Lack of attention to the measurement of acceptability

- Inconsistent types of measures of acceptability

- Acceptability is "multifaceted"
  – Majority studies use single measure
  – Acceptability is a term to describe multiple measures
  – Cannot conclude acceptability based on single measure
    - If using satisfaction, conclude satisfaction

Moment-by-Moment in Women's Recovery (MMWR)

- MBI for SUD
  - Adapted from Mindfulness-Based Stress Reduction
    - Ethnoracially diverse women
    - Low literacy
    - Low income
    - Relatable content and examples
    - Trauma and mental health

MMWR

- 80 minutes, 2x week, 12 sessions, 6 weeks
- During residential treatment
- MMWR facilitators
  - trained in both MBSR and MMWR
  - on-site master's-level clinician
- Instructional manual with standardized lesson plans

MMWR

- Class segments:
  - Welcome, brief check-in, discussion of objectives, brief mindfulness practice
  - Educational presentation, discussion of content
  - Mindfulness practice related to the session themes
  - Sitting or walking meditation, body scan, or stretching
  - Review reading and practice assignments for the next class, and closing meditation

MMWR

- Topics:

  - Preventing relapse
  - Building inner safety in treatment
  - Healthy ways of coping with stress
  - Role of perceptions
  - Anxiety, fear, & panic attacks

  - Shame & guilt
  - Self-talk
  - Mindful communication
  - Anger & violence
  - Painful thoughts

Purpose

- To test intervention and participant characteristics that may be associated with acceptability:
  - time in treatment prior to starting the intervention
  - mindfulness predisposition
  - trauma severity
- To test the association between acceptability factors (satisfaction and practice) and mindfulness application at the end of session 12

Methods - Procedures

- Screening assessments were conducted to determine eligibility prior to consent and in-person interviews

- Further information was abstracted from clinic records

- Acceptability data were collected via self-administered surveys during intervention sessions.

Methods - Procedures

Inclusion Criteria

- a new patient at the study site
- female
- 18-65 years of age
- diagnosed with SUD
- fluent in English
- agree to participate.

Exclusion Criteria

- inability to understand or sign the informed consent
- have a cognitive impairment
- have any untreated psychotic disorder/severe mental health disorder
- be imprisoned
- have reported suicidality (past 30 days)
- be over six months pregnant.

Methods – Measurements

- Demographics/Covariates - Baseline
  - Age, Education (years), Race/Ethnicity

- Time in Treatment
  - number of days between treatment entry and intervention start

Methods – Measurements

- Mindfulness Predisposition - Baseline
    - Five Facet Mindfulness Questionnaire (FFMQ)
    - 25 items, 5 subscales, 1= "Never/rarely" to 5 = "always"
        - observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience
    - Sample item: I paid attention to sounds, such as clocks ticking, birds chirping, or cars passing

- Trauma severity - Baseline
    - PTSD Symptom Scale - Self Report (PTSS-SR)
    - 17 items, 3 subscales, 0 = "Not at all" to 4 = "almost always"
    - Sample item: how often have you been bothered by having bad dreams or nightmares about the traumatic events?

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Methods – Measurements

- ## Satisfaction – Session 2
  - 17-items, 1= "not at all" to 5 = "very much"
  - Sample item: How much did you enjoy participating?

- ## Formal Practice – Session 3
  - 6 items, 0 = "Never" to 5 = "4 or more times a day"
  - Sample item: How often did you practice walking meditation?

- ## Informal Practice – Session 3
  - 8 items, 0 = "Never" to 5 = "4 or more times a day"
  - Sample item: How often did you practice or use mindfulness to be aware of your emotions?

Methods – Measurements

- Mindfulness Application – Session 12
  - Applied Mindfulness Practice Scale (AMPS)
  - 15 items, 3 subscales, 0 = "never" to 4 = "almost always"
    - Decentering, positive emotion regulation, negative emotion regulation
  - Sample item: In the past 7 days, I used mindfulness practice to see that my thoughts are not necessarily true

Participants

Variable	Mean (SD)	N = 100
Age	32.38(9.82)	
Race/Ethnicity		
Hispanic		**60**
Non-Hispanic Black		18
Non-Hispanic White		20
Other		2
Education (years)	11.67 (2.15)	
Living Situation (8 months prior to Tx)		
Homeless		25
Non-stable		7
Institution		16
Own place		17
Someone else's		35
Mandated to Treatment		83
Religious Preference		
Christian		**83**
Other Religion		2
Other Beliefs		5
Atheist		10

Results - Correlation

Measurement	1	2	3	4	5	6	7	8	Mean	SD
1. Age	—								32.38	9.82
2. Education	-.00	—							11.67	2.15
3. Days pre Int	.03	.10	—						37.35	15.90
4. MF Predisp	-.02	.13	.16	—					79.96	12.74
5. PTSS	-.02	.01	-.19	**-.31****	—				16.23	11.94
6. Satisfaction	.06	-.09	.18	.05	-.17	—			3.98	0.72
7. F. Practice	**.25***	.14	.13	.12	.14	**.25***	—		1.97	1.06
8. I. Practice	.05	**.22***	.17	**.22***	.12	**.23***	**.68*****	—	2.34	1.24
9. Applied MF	.04	-.01	.03	**.25***	-.13	**.26***	.22	**.26***	43.66	11.06

Results - ANOVA

Racial/Ethnic differences

Variable		Sum of Squares	df	Mean Squares	F	Sig.
Satisfaction						
	Between	3.39	3	1.13	2.26	.09
	Within	43.11	86	0.50		
	Total	46.50	89			
Formal Practice						
	Between	4.18	3	1.40	1.26	.30
	Within	88.68	78	1.11		
	Total	90.86	81			
Informal Practice						
	Between	4.26	3	1.42	0.92	.44
	Within	120.99	78	1.55		
	Total	125.25	81			
Mindfulness Application						
	Between	263.16	3	87.72	0.71	.55
	Within	8176.61	66	123.89		
	Total	8439.77	69			

Results – Regression 1

DV - Satisfaction

Predictor	R^2	F	β	t	p	95% CI
Model summary	.05	1.46			.23	
Days in treatment prior to intervention start			.15	1.38	.17	-.00, .02
Mindfulness Predisposition			-.03	-.23	.82	-.01, .01
Trauma Severity			-.14	-1.23	.22	-.02, 01

Results – Regression 2

DV – Formal Practice

Predictor	R^2	F	β	t	p	95% CI
Model summary	**.14**	**3.05**			**.02**	
Age at baseline			**.27**	**2.45**	**.02**	.01, .05
Days in treatment prior to intervention start			.11	.98	.33	-.01, .02
Mindfulness Predisposition			.18	1.55	.13	-.01, .03
Trauma Severity			**.25**	**2.15**	**.03**	.00, .04

Results – Regression 3

DV – Informal Practice

Predictor	R^2	F	β	t	p	95% CI
Model summary	**.14**	**3.12**			**.02**	
Years of Education			.16	1.52	.13	-.03, .21
Days in treatment prior to intervention start			.14	1.23	.22	-.01, .03
Mindfulness Predisposition			**.24**	**2.08**	**.04**	.00, .04
Trauma Severity			**.23**	**1.99**	.05	.00, .05

Results – Regression 4

DV – Mindfulness Application

Predictor	R^2	F	β	t	p	95% CI
Model summary	**.20**	**2.24**			**.05**	
Days in treatment prior to intervention start			-.02	-.13	.90	-.18, .16
Mindfulness Predisposition			.21	1.52	.14	-.05, .36
Trauma Severity			.02	.10	.92	-.23, .26
Satisfaction			**.33**	**2.36**	**.02**	.76, 9.41
Formal Practice			.00	.02	.98	-3.28, 3.36
Informal Practice			.21	1.26	.21	-1.11, 4.86

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Discussion

- Time in treatment prior to intervention start did not predict any acceptability variables
  - May be able to introduce sooner without reducing acceptability
- Mindfulness Predisposition was related to informal practice but not formal practice or satisfaction
  - Intervention is acceptable even among women with lower mindfulness predisposition, but they may not have as frequent of informal practice by session 3

Discussion

- Satisfaction was the strongest predictor of mindfulness application
  - It is important for women to enjoy the intervention and find the teachings useful for them to apply the teachings later

Discussion

- No significant Race/Ethnic differences
- Trauma severity was a positive predictor of formal and informal practice
- Limitations
  - Small sample size
  - Possible third variable effects
- Future Directions
  - Further investigate what predicts satisfaction
  - Assess longitudinal acceptability

Implications

- Evidence-based interventions are not one-size-fits all, but it can be difficult to personalize interventions to fit everyone

- Identifying participant characteristics that influence acceptability of the intervention can inform precise adaptation designed for specific subgroups

Intervention Adaptation

- Many adaptive modifications mainly address surface structure, rather than deep structure
  - Surface structure: matching intervention materials and messages to observable 'superficial' characteristics of the target population
    - Language translation
  - Deep structure: involves incorporating the cultural, social, historical, environmental, and psychologic forces that influence the target health behavior in the proposed target population (Resnicow et al., 2000)
    - Relatable content and examples

Resnicow, K., Soler, R., Braithwaite, R. L., Ahulwalia, J. S., & Butler, J. (2000). Cultural sensitivity in substance use prevention. *Journal of Community Psychology, 28(3)*,271-290.

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Social Determinants as Contextual Factors in Health

- Social Determinants of Health
  - Conditions in the environments that affect a wide range of health, functioning, and quality of life outcomes and risks (DHHS, 2014)
- Social determinants include:
  - Poverty
  - Residential segregation
  - Access to:
    - Education, training, jobs
    - Health care services
    - Community-based resources
    - Resources to meet daily living needs
  - Social support
  - Exposure to crime

US Department of Health and Human Services (DHHS) (2014). *Improving Cultural Competence: A Treatment Improvement Protocol.* SAMHSA TIP 59 (p. 21). Washington, DC: DHHS.

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Health Disparities

- Health Disparities
- Differences in the incidence, prevalence, morbidity, and burden of diseases and other adverse conditions that exist among specific population groups. (DHHS, 2014)
    - Have multiple determinants
        - Disparities in SES a major cause
        - Lack of access to quality care
    - Include historical inequities
    - Persistent racial and ethnic discrimination
    - Distrust of the health care system
- Account for higher rates of mortality and morbidity
- Current limitations in evidence-based interventions in reducing health disparities

US Department of Health and Human Services (DHHS) (2014). *Improving Cultural Competence: A Treatment Improvement Protocol.* SAMHSA TIP 59 (p. 20). Washington, DC: DHHS.

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Social Determinants of Health Disparities

- Reducing health disparities involves eliminating health inequalities by creating, "public health systems that translate efficacy documented by research into effectiveness in the community."
  - Koh, Oppenheimer, Massin-Short, Emmons, Geller, & Viswanath, 2010, p. S72

Koh, H., Oppenheimer, S. C., Massin-Short, S. B., Emmons, K. M., Geller, A. C., Viswanath, K. (2010). Translating research evidence into practice to reduce health disparities: A social determinants approach. *American Journal of Public Health, 100*, S72-S80.

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Future Directions

- Scaling up interventions for broad dissemination
    - Applicable to large groups
    - Relatable and relevant to specific groups
    - Cost-effectiveness
- Theoretical Congruence
    - Maintain fidelity while improving fit

Castro, F. G., Barrera, M., **& Bautista, T.** (2018). Empirically-based treatments: Adapting behavioral medicine change strategies to meet the needs of integrative care… With an appreciation of culture. In M. P. Duckworth & W. T. O'Donohue (Eds.), Behavioral Medicine and Integrative Care: Efficient Delivery of the Most Effective Treatments (pp. 89-117). Springer, Cham.

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About me