

Utilizing exercise as a component of substance use disorders treatment

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Objectives

1. Understand the underlying mechanisms by which exercise may reduce substance use.
2. Examine current evidence for exercise as an intervention for substance use disorders (SUD) treatment.
3. Identify common barriers (and solutions) to implementing exercise within a SUD treatment setting.

Defining SUD

Self-regulation: ongoing, dynamic, adaptive modulation of emotion, cognition, and behavior.

Modulation is done via proactive (top-down) and reactive processes (bottom-up).



Defining SUD

Deficits in self-regulation are a hallmark of SUD:

1. Deficits around top-down (proactive) processes
2. Deficits around bottom-up (reactive) processes



Stress and SUD



Stress activates the reactive self-regulation processes that maintains substance use

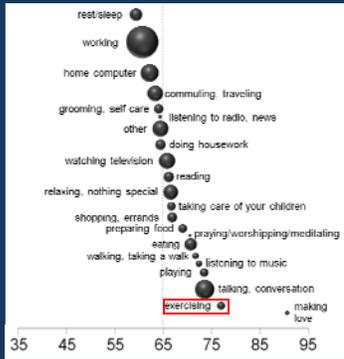
- Individuals with SUD experience stress more frequently and more intensely compared to non-SUD individuals.
- Stress leads to substance use.
- Biological response (e.g., cortisol) to stress is impaired and predicts relapse after treatment.

Sinha, 2008

How does exercise address the factors associated with the development and maintenance of SUD?



Underlying Mechanisms – Emotion Regulation



Killingsworth & Gilbert (2010)

Underlying Mechanisms

Effects of Exercise:

1. *It makes you feel good!*
 - Positive mood induction

**RUNNERS
HIGH**
> STILL LEGAL <
IN ALL 50 STATES

Underlying Mechanisms

Effects of Exercise:

1. *It makes you feel good!*



2. *Stress buffering effects*

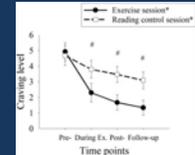
- Exercise activates the same underlying biological “fight or flight” stress response systems without stress.
- Biological response to stress improves.
- Leads to experiencing stress less intensely and for a shorter duration.

Throne et al. (2000)

Underlying Mechanisms

Effects of Exercise:

1. *Positive mood induction*
2. *Stress buffering effects*
3. *Reduces Cravings*



- A single bout of aerobic exercise reduces cravings to use substances.
- There is a cumulative effect of exercise on craving over repeated bouts of exercise.

Brown et al., 2016; Ussher et al., 2004; Wang et al., 2015

Underlying Mechanisms

Effects of Exercise:

1. *Positive mood induction*
2. *Stress buffering effects*
3. *Reduces Cravings*
4. *Enhances cognitive functioning*



- Small to moderate improvements in attention, judgment, decision making, problem solving.

Quick Summary

1. Exercise reduces inputs into the bottom-up (reactive) self-regulation processes that bring out the desire and urge to use a substance.
2. Exercise strengthens top-down (proactive) processes that are required for clean and sober living.

Current Evidence

Studies of natural recovery find that individuals frequently make other health-behavior changes, such as exercise, when they quit or reduce their substance use.

Why?



King & Tucker, 2000

Current Evidence

Exercise has been examined in a range of settings:

1. Prison methadone maintenance programs
2. Residential methamphetamine tx programs
3. Outpatient alcohol use disorder tx programs
4. Hazardous drinking college students

Brown et al., 2014; Cutter et al., 2014; Dolezal et al., 2013; Walker et al., 2010; Weinstock et al., 2016

Current Evidence

Findings:

1. Reductions in stress, depression, and anxiety
2. Improvements in quality of life
3. Reduction in drinking days and heavy drinking episodes*

* These gains were not found in those who did not adhere to the exercise intervention.

Brown et al., 2014; Cutter et al., 2014; Dolezal et al., 2013; Walker et al., 2010; Weinstock et al., 2016

Prescribing Exercise

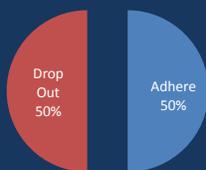
Public Health Guidelines:

1. 150-300 minutes of moderate intensity aerobic exercise per week. Typically done over 3-5 days.

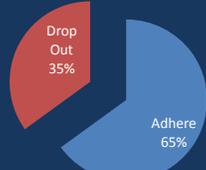


Common Barriers – Adherence!

Exercise with No Incentives

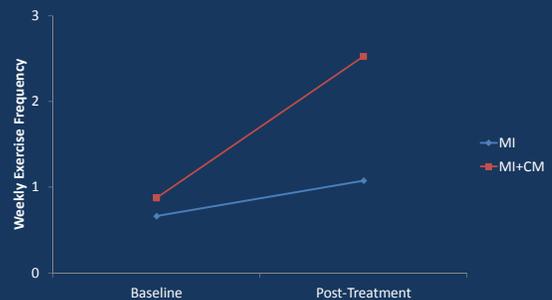


Exercise with Incentives



Brown et al., 2014; Dishman, 1988

Offering Incentives - Exercise Frequency



Weinstock et al., 2014

Motivational Intervention for Exercise

We have developed a protocol that combines motivational interviewing (MI) and contingency management (MI+CM).

Motivational interviewing seeks to resolve ambivalence and enhance intrinsic motivation to change.

CM is a behavioral intervention that is used as a tool to enhance treatment and facilitate change.

Motivational Interviewing (MI)

Ask clients about values and goals.

- How does exercise fit within these values and goals?

Ask clients about benefits they may get from regular exercise?

Explore impact of physical activity/inactivity upon client's life.

How does exercise fit in their desire and plan to change their substance use?

Contingency Management (CM)

Three central tenets of effective CM:

1. Frequently **monitor** a specific target behavior.
2. Provide tangible positive reinforcement **each time** the target behavior is demonstrated.
3. **Withhold** positive reinforcement if the target behavior does not occur. Can add in a slight punisher.



CM for Exercise



1. Frequently **monitor** exercise: pedometer, fit bits, heart rate monitors, exercise apps.
2. Provide reinforcement **when exercise** occurs: fish-bowl CM – opportunity to win prizes/gift certificates.
3. **Withhold** reinforcement if exercise does not occur: No draws from the prize bowl .

Weinstock et al., 2017

Incorporating Exercise Into SUD Treatment

Issues (barriers) to consider:

1. Is it safe for my clients to exercise?
2. Where will they exercise?
3. Supervised or monitored exercise?

Weinstock et al., 2017

Safety



Clients need to be screened to ensure that exercise is not contra-indicated.

ACSM Pre-participation Screening

- Determine if medical clearance by a physician or other qualified health care provider is needed before exercise begins
- Screening process focuses on (1) current physical activity levels, (2) presence of diagnosed cardiovascular, metabolic, or renal disease, or signs and/or symptoms of these diseases, and (3) the intensity of exercise that will be prescribed.

Riebe et al., 2015

Where Will They Exercise?

1. SUD treatment facility?
 - **Pro:** Allows for supervision; **Con:** Costly
2. Local fitness center/gym?
 - **Pro:** Reduced liability; **Con:** Less oversight. Who pays for membership? How to verify exercise?
3. Home-based exercise?
 - **Pro:** No membership; **Con:** Less oversight. How to verify exercise?

Conclusions

1. SUD is characterized by deficits in self-regulation.
2. Exercise has benefits on both bottom-up (reactive) and top-down (proactive) self-regulation processes.
3. Exercise has been shown to reduce drinking, depression, anxiety and stress while improving physical fitness and quality of life.
4. There are implementation barriers including adherence, safety, and monitoring.

Suggested Reading

Weinstock, J., Farney, M.R., Elrod, N. M., Henderson, C. E., & Weiss, E. P. (2017). Exercise as an adjunctive treatment for substance use disorders: Rationale and intervention description. *Journal of Substance Abuse Treatment*, 72, 40-47.

