Mindfulness-Based Interventions for Addictions among Diverse and Underserved Populations

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Abstract

Mindfulness-based interventions (MBIs) show strong promise for treating addictions, but there is much work to be done to ensure that they are culturally appropriate, accessible, and optimally effective for priority populations who could potentially have the most to gain. This article briefly highlights research on MBIs for addictions among diverse and underserved populations and proposes next steps for increasing their potential to target addiction-related health disparities. Future directions include: 1) Prioritize diversity in clinical trials and conduct appropriately powered moderation analyses; 2) Consider treatment adaptations; 3) Examine underlying mechanisms to optimize MBIs for specific populations; 4) Improve implementation in community-based and other appropriate settings; and 5) Consider use of technology to provide just-in-time support and increase scalability for diverse populations.

Because escaping, avoiding, and reducing negative affect and craving are key drivers of substance use, mindfulness training is a particularly promising approach for addressing addictive behaviors [1]. Mindfulness involves non-judgmental attention to moment-to-moment sensations (including unpleasant emotions, cravings, and withdrawal symptoms), which is thought to foster more flexible, adaptive responses instead of automatically reacting through substance use. Mindfulness training helps people to recognize triggers, accept them for what they are, and more skillfully "ride them out" without trying to push them away by misusing substances. Several mindfulness-based interventions (MBIs) have been developed to target addictive behaviors, including alcohol, tobacco, and illicit substance use [2,3]. These include Mindfulness-Based Relapse Prevention (MBRP [4]), Mindfulness-Oriented Recovery Enhancement (MORE [5]), Mindfulness-Based Addiction Treatment (MBAT [6]), and mindfulness training for smoking cessation [7,8]. A meta-analysis on MBIs for substance misuse concluded that these interventions reduced substance use frequency, craving, and stress with small-to-large effect sizes [2]. Recent articles have reviewed the

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overall state of the science on MBIs for addictions and made recommendations for future research [e.g., 3,9]. This paper discusses current evidence and future directions with specific focus on ways to understand and optimize these interventions for more diverse and underserved populations.

Overall, certain sub-populations (e.g., individuals with low-socioeconomic status [SES]; racial/ethnic minorities; lesbian, gay, bisexual and transgender [LGBT] men and women; adults with serious mental illness) have not been well represented in mindfulness research [10,11]. A systematic review of randomized controlled trials of Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) in the U.S. found that the samples included almost 20% more Caucasians compared to the U.S. population, mean education levels were much higher than the national average, and none of the studies reviewed specifically reported effectiveness among racial/ethnic minority or low-SES populations [10]. Low SES, racial/ethnic minority, and LGBT populations experience tremendous disparities in healthcare access, addiction treatment outcomes, and addiction-related morbidity and mortality [12–14]. High levels of stress (e.g., financial strain; neighborhood disadvantage; discrimination) contribute to addictive behaviors and higher rates of lapse and relapse in disadvantaged populations [13–17]. There is much work to be done to ensure that MBIs for addiction are culturally appropriate, accessible, and optimally effective for priority populations who could potentially have the most to gain. This article briefly highlights some of the work on MBIs for addictions among diverse and underserved populations and proposes next steps for increasing their potential to target addiction-related health disparities.

Rationale and Current Evidence

Rationale

Although most mindfulness research has included predominantly White, heterosexual, cisgender, and relatively affluent populations, there is reason to believe that MBIs might be particularly effective in marginalized populations. First, given that mindfulness is thought to serve as a buffer against health consequences of stress [18], MBIs could be particularly useful for people with more stressful life experiences. For example, research suggests that MBCT is more effective for preventing depressive relapse among individuals with history of childhood trauma [19]. Second, MBIs might target specific intrapersonal and interpersonal stressors that impede progress in addiction treatment for disadvantaged populations (e.g., difficulties coping with discrimination, low self-efficacy, low social support). Third, MBIs foster self-compassion and self-acceptance, which could be particularly valuable in the context of marginalization [20,21]. Fourth, personal mindfulness practice (e.g., mindfully focusing on one's breath) does not require a high degree of education or material resources, and can be practiced independently in the context of daily life experiences. We found that low-SES African American adults viewed the ability to practice mindfulness on their own as empowering [22].

Current Evidence

MBIs have been used to target stress, depression and quality of life in various marginalized populations, including low-income African American women [23], severely socioeconomically disadvantaged populations [24,25], and gay men living with HIV [26]. Recent studies of MBIs for addiction have also included more diverse populations. For example, MBIs have shown benefits for smoking cessation in low-SES [8,27] and racially/ ethnically diverse adults [6,7]. Research also supports the use of MBIs for reducing craving, stress, and relapse to drug and alcohol use among racially/ethnically and socioeconomically diverse samples [28,29], women criminal offenders [29], recently homeless men with co-occurring substance use and psychiatric disorders [30], and low-income women with trauma history [31].

A handful of recent studies have explored differential effects of MBIs for addictions by sociodemographic and other individual characteristics. Researchers found that MBRP was more efficacious than traditional relapse prevention for reducing drug use and preventing drug use relapse among racial/ethnic minority women [20,32]. Another study suggested that MBRP was particularly effective among participants with high-severity substance use disorders and co-occurring depression and anxiety [33]. Overall, MBIs for addictions show strong promise for low-SES and racial/ethnic minority populations, as well as those with psychiatric comorbidities. However, more research is needed to examine and optimize these interventions for diverse and underserved populations, and several future directions are outlined below.

Future Directions

1) Prioritize diversity in clinical trials and conduct appropriately powered moderation analyses.

As the science of MBIs for addictions moves forward, it will be critical to ensure that clinical trials include participants from diverse backgrounds. There has been very limited research examining whether the efficacy of these interventions differs for people of various cultural backgrounds and symptom profiles, with a few notable exceptions [20,32,33]. These analyses have largely been post-hoc, and various subgroups have been combined (e.g., categorizing participants as racial/ethnic minority vs. non-Hispanic White). Clinical trials should not only include diverse samples but also have appropriate statistical power to determine whether individual difference variables moderate treatment effects. Strategies to increase diversity in MBI clinical trials [10] include conducting cultural sensitivity training with research staff; providing transportation, childcare, and food; offering flexible scheduling; providing interventions and assessment materials in multiple languages; and ensuring that eligibility criteria are not overly restrictive.

It will be also be important to understand whether certain populations are more likely to experience adverse effects of MBIs. Although mindfulness meditation is generally associated with improved clinical outcomes, it has been associated with adverse reactions (e.g., psychotic episodes, religious delusions, pain [34]). Treatment adaptations may be

needed to minimize adverse effects and/or provide extra support, and it could be that mindfulness training is not appropriate for people with certain clinical profiles.

2) Consider treatment adaptations.

Cultural competence is critical in the delivery of addiction treatments [12,35], and research should consider what (if any) cultural adaptations are needed to improve MBIs for diverse populations [36]. This could include both surface-structure (e.g., using culturally-relevant examples and language) and deep-structure adaptations [35] (e.g., encouraging self-compassion in the context of stigma and the coming-out process for LGBT populations [21]). See Amaro et al. [31] for discussion of MBI adaptations for addressing substance use among low-income, racially/ethnically diverse women with trauma history.

Qualitative research can help to elucidate individuals' needs and preferences, as well as suggestions for making MBIs more relevant, appealing, and accessible. Based on our qualitative work with low-income, predominantly African American adults seeking mental health services, we provided the following recommendations [22]: a) engage in open discussion about the terms "mindfulness" and "meditation," including any preconceived ideas, and use more familiar terms like "paying attention;" b) prepare participants for potential unpleasant experiences during meditation and provide extra support in the context of trauma history (e.g., leaving lights on and eyes open, shortening/moving the body scan to later sessions); c) work collaboratively with participants to identify barriers to mindfulness practice, recognizing that informal practice (e.g., pausing for mindful breaths throughout the day) may be more feasible and acceptable than longer formal meditation; d) discuss religion and/or spirituality based on participant preferences (e.g., several participants practiced mindfulness in the context of praying, reading religious texts, or listening to spiritual music); and e) consider ways of promoting empowerment in marginalized populations. MBIs can encourage mindful attention to personal and community strengths/resources rather than focusing excessively on stressors and risk factors. When discussing specific stressors like discrimination, it should be noted that mindful acceptance is not the same thing as resignation. Participants might practice treating themselves kindly in the midst of difficult situations while also mobilizing resources for change.

It will be important to understand how much formal and informal between-session mindfulness practice is feasible and necessary to achieve clinical outcomes for various populations. Some research has linked greater mindfulness practice to better outcomes [37], including lower alcohol and drug use [38] and lower smoking frequency [7]. However, it is also critical to meet people where they are to ensure that mindfulness practice is feasible (e.g., for those who may not have safe, quiet spaces in which to close their eyes for formal meditation).

Given that matching therapists and clients on race/ethnicity and language may improve retention and clinical outcomes [39], MBIs might be more successfully implemented by therapists with similar backgrounds to the target population. The sociodemographic composition of the group may also be important to consider: Greenfield et al. [32] found that racial/ethnic minority participants evidenced better alcohol and drug use outcomes when

more than half of their MBRP group were also minorities. So far, treatment adaptations have generally been examined in small feasibility studies and will need to be rigorously tested.

3) Examine underlying mechanisms to optimize MBIs for specific populations.

A better understanding of key mechanisms through which MBIs impact addictive behaviors could inform the development of more efficacious and cost-effective interventions. MBIs could be improved by increasing focus on the most potent mechanisms and/or removing components that do not directly target those mechanisms. Although this work is still in its infancy, researchers have highlighted promising neurobiological and psychosocial mechanisms of MBIs [1,9,40–43]. MBI mechanisms of action may not be the same for everyone and should be studied among diverse populations. We found that dispositional mindfulness predicts lower affective volatility (i.e., greater emotional stability [44]) and weakens the association between stress and alcohol use [45] among African American smokers. Given that high stress/negative affect, neighborhood disadvantage, and low social support all mediate the association between low SES and difficulties quitting smoking [46], mindfulness training might specifically target these mechanisms in low-SES smokers. Similarly, discrimination and social isolation are linked to tobacco use in disadvantaged populations [13]. If MBIs reduce addictive behaviors by enhancing coping with discrimination or bolstering social resources in certain subgroups, interventions could be optimized by increasing focus on these components.

There is also a need for innovative methodology to advance the science of MBI mechanisms. Because several purported mechanisms (e.g., negative affect, craving) fluctuate on a moment-to-moment basis, ecological momentary assessment (EMA [47]) could help to elucidate real-time, real-life mechanisms. Ongoing work using neurobiological methods also holds promise [48], but research is needed with larger and more diverse samples.

4) Improve MBI implementation in community-based and other appropriate settings

It is critical to understand how to reach diverse populations by implementing MBIs in appropriate settings (e.g., community-based health centers, psychiatric facilities, correctional institutions) so that implementation is feasible but does not compromise effects of validated interventions. Potential adaptations to improve implementation include: changing the number, length, and/or frequency of MBI sessions; providing open groups with rolling enrollment (allowing individuals to begin treatment when ready, rather than waiting for the next cohort); and offering ongoing support/meditation groups for relapse prevention. Although the classic MBSR and MBCT protocols include eight weekly 2–2.5-hour sessions and day-long retreat, this may not always be feasible. For example, adapted MBSR protocols for low-income African American women at a federally qualified health center and low-income housing residence included eight weekly 90-minute sessions and no retreat [23,49].

Recent work supports the feasibility and acceptability of providing MBRP on a rolling basis with two 60-minute sessions/week for 4 weeks [50]. Ongoing "booster" sessions or drop-in meditation groups could also be beneficial, given that long-term relapse prevention is paramount. In our work delivering MBAT to low-income African American smokers, a common suggestion was to offer more sessions after the 8-week treatment period [51].

Overall, the above protocol alterations have not been rigorously tested. Future trials should examine which adaptations are most useful for improving treatment acceptability, adherence, and clinical outcomes.

5) Consider use of technology to provide just-in-time support and increase MBI scalability for diverse populations

In-person MBIs require substantial time and resources, which severely limits access for populations with limited healthcare access, inflexible work schedules, and difficulties with transportation/childcare. Preliminary research supports the feasibility of delivering mindfulness-based smoking cessation treatment through internet-based videos with telephone support, with targeted recruitment toward low-SES adults [52]. MBIs for addictions might also be delivered through mobile health technology (mHealth; e.g., text messaging, mobile applications [apps]), given that increased smartphone penetration has been especially pronounced among low-income adults [53]. These interventions could reduce stigma associated with in-person treatment, encourage coping strategies in real-time in users' natural environments (e.g., in moments of high stress or craving), and standardize treatment in a way that is typically not possible with in-person services. These approaches can be personalized to individual risk factors and preferences, and are highly scalable with relatively low costs compared to in-person services. mHealth approaches could also be used for continuing care after active MBI protocols have ended.

At least two smoking cessation apps with focus on mindfulness and acceptance – "Craving to Quit" [54] and "SmartQuit" [55] – show promise. However, mHealth programs for addictive behaviors have generally not been developed with focus on disadvantaged populations. In developing a mindfulness-based text messaging program for smoking cessation among low-SES African American adults, we conducted a series of qualitative studies and iterative revisions with the goal of developing a program that is consistent with users' needs and preferences [56]. Text messages reminded participants to practice mindfulness both formally and informally (e.g., "John, try 'STOP.' Stop, Take a deep breath, Observe what's going on right now, Proceed with your day") and were designed to be personalized and interactive (e.g., "Remember, John, you are quitting for your baby Kayla, your health, and to save $2,373 per year;" participants could also text keywords at any time to receive tips for managing cravings, stress, or lapses). Interestingly, although participants knew that the text messages were automated, they often noted a sense of social support and accountability (e.g., described as a "friend" or "coach" [56]). Our preliminary clinical trial suggested that the text messaging program ("iQuit Mindfully") was most effective for participants living in poverty (e.g., among participants living below the federal poverty line, smoking cessation rates were higher for those receiving iQuit Mindfully compared to in-person-only treatment, but there were no differences in smoking cessation by treatment condition in the overall sample [57]). This type of 24/7, personalized support could be particularly beneficial for populations who have lower access to treatment and/or need additional services/support when attempting to change their substance use. Data collected via mobile wireless sensors (e.g., physiological indicators of high stress) and geolocation information (e.g., proximity to tobacco outlets or other high-risk locations) could also be integrated with mobile apps to trigger just-in-time intervention.

Future directions for studying technology-delivered MBIs for addiction include: a) conducting larger trials comparing technology-delivered vs. in-person MBIs in diverse samples; b) tailoring these approaches to specific populations (e.g., ensuring that literacy levels are appropriate and platforms are user-friendly; including culturally relevant content); c) exploring ways to foster social support (one aspect of in-person MBI groups that could be lost); d) developing creative ways to increase engagement (given that low user engagement is a pervasive problem with mobile apps [58]); e) examining what the most effective treatment "dose" might be when delivered via technology; and f) exploring how to make effective programs readily accessible to underserved populations.

Conclusions

Preliminary research supports the use of MBIs for addictions among low-SES and racial/ethnic minority populations, as well as adults with psychiatric comorbidities. However, there is much work to be done to expand and optimize the benefits of MBIs for populations who could potentially have the most to gain (e.g., low-SES, racial/ethnic minority, LGBT, serious mental illness). We need to understand how and for whom MBIs for addiction work, how to adapt these interventions for specific populations, and how to increase feasibility, acceptability, effectiveness, and scalability. Some specific future directions include: recruiting diverse populations for clinical trials and examining whether MBI effects differ based on sociodemographic and other individual characteristics; developing and evaluating cultural adaptations; elucidating underlying mechanisms to optimize effectiveness for specific populations; developing feasible ways of implementing MBIs in various settings; and studying technology to deliver just-in-time, personalized support and increase the reach of MBIs for diverse and underserved populations.

Acknowledgements:

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Highlights

- MBIs for addictions show promise in low-SES and racial/ethnic minority populations.

- MBI clinical trials should prioritize diversity and conduct moderation analyses.

- Cultural adaptations of MBIs could increase acceptability and effectiveness.

- Ways to improve implementation in various treatment settings should be considered.

- MBIs could be delivered via technology to increase reach among diverse populations.