A Literature Review of Mindfulness Based Stress Reduction Interventions Conducted Amongst Low Income and Ethnic Minority Populations

Examining Access and Interest in Mindfulness Based Programs Within Low Income Communities In Providence, RI

By

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Table of Contents

List of Tables and Figures

Part I: Literature Review

A Literature Review of Mindfulness Based Stress Reduction Interventions Conducted Amongst Low Income and Ethnic Minority Populations

Introduction

Mindfulness-based stress reduction (MBSR) is an intervention that introduces mindfulness to support individuals with chronic pain and a range of other health conditions. MBSR was initially developed at the University of Massachusetts Medical Center in the 1970s by Professor Jon Kabat-Zinn as a way to treat ailments that can be multifaceted and challenging to address in a medical setting. (Kabat-Zinn, 2003; Kabat-Zinn, 1990) This technique uses a combination of meditation, body awareness exercises, and yoga to help people become more mindful, and overall healthier. Recent research suggests that mindfulness and meditation practices may have beneficial effects, including stress reduction, relaxation, and improvements to quality of life (Gotink, 2015).

MBSR interventions have been modified to treat or enhance treatment for a host of health diagnoses from hypertension to cardiovascular health, however, most MBSR interventions have been performed in an academic or university setting on middle to high socioeconomic status (SES), white individuals. While this is a low-cost intervention with proven benefits, there is a level of inaccessibility of mindfulness based interventions amongst individuals with low SES and racial or ethnic minorities. (Palta, 2012) The purpose of this paper is to review literature that evaluates acceptability, feasibility and health impacts of MBSR interventions delivered to low SES individuals. In looking at how MBSR interventions have been modified to meet the needs of

low SES individuals, I hope to make recommendations and set a framework for future interventions to this population based on common themes.

Currently, a wide range of literature exists about MBSR interventions. The curriculum was originally designed to reduce stress and symptoms that are associated with high levels of stress. (Kabat-Zinn, 2003; Kabat-Zinn, 1990) The positive results of the initial MBSR intervention have been adapted into other interventions, modified to treat high blood pressure, depressive symptoms, cardiovascular health, and post-traumatic stress disorder. (Gotink, 2015) Randomized controlled trials (RCT's) have been designed with curriculum modifications to be most effective at addressing the outcome of the intervention. (Gotink, 2015) Few interventions have been designed for low income communities to alleviate the stress associated with poverty, and even fewer in low income foreign settings such as Sub Saharan Africa, where the burden of poverty and health disparities is the highest. (World Bank, 2016) This could be due to a lack of cultural understanding, resources to translate and adapt materials, or doubts about acceptability or feasibility of the intervention in non-Western cultures. All literature reviewed for this paper explores the acceptability and feasibility of implementing this intervention amongst low income communities or individuals, with modifications to the specific study population. Feasibility is referred to as participants' initial interest in participating in MBSR and their continued participation throughout the intervention, and acceptability as whether or not the participants perceived MBSR as relevant and useful to their lives in some way (Dutton, 2013).

Studies have shown that poverty impedes cognitive functioning, and adds stress which impacts cognitive thinking patterns. (Anandi, 2013) Lacking money, resources, or time can lead to poor decision making. It is hypothesized that poverty imposes a cognitive load that reduces attention

and effort to tasks at hand, perpetuating poverty even further. (Anandi, 2013) In 2012, 501 million people, or 47 percent of the population of Sub-Saharan Africa, lived on $1.90 a day or less, a principal factor in causing widespread hunger, which then leads to stress. (World Bank, 2016**)** The stress of poverty disproportionately affects Sub Saharan Africa, making this population ideal for MBSR interventions. MBSR could be effective to address the heavy cognitive load of poverty as it influences mindfulness and awareness of thought patterns. While MBSR might not be able to generate wealth for an individual or community, it can support healthier thought patterns and personal behaviors that lead to a better quality of life, and ultimately, less stress.

Objectives

(1) To evaluate the health impacts and feasibility of Mindfulness based stress reduction (MBSR) interventions in low SES and ethnic minority populations, through a systematic review, and (2) To evaluate best practices for conducting or modifying interventions in low income communities in MBSR going forward.

What is MBSR?

While mindfulness is the underlying mechanism that allows MBSR to work, the structure of the therapy program also plays a role. MBSR is designed to be an 8–10 week group program with 2.5 hour sessions per week, in groups varying between 10 and 40 participants. The group sessions should be conducted by a leader who is formally trained to teach MBSR, and will lead the participant in mindfulness-based activities, which the individual can tailor to their personal needs (Eberth & Sedelmeir, 2012; Grossman et al., 2004; Kabat-Zinn, 1990). Interventions focused on different populations and outcomes have modified therapy programs to meet the

needs of those unique populations, however, while reviewed interventions were conducted amongst a variety of conditions, the study populations are in the United States, and not among low income communities.

The prototype program was developed at the Stress Reduction Clinic at the University of Massachusetts Medical Center. The original model has been successfully utilized with appropriate modifications as determined by the facilitator in a number of other medical centers, as well as in non-medical settings such as schools, athletic training programs, and professional programs. (Kabat-Zinn, 2003; Kabat-Zinn, 1990) The curriculum, or structure and methods of the program are carried out by a trained MBSR leader and outlined as follows. The intervention starts with a group pre-program orientation sessions (2.5 hours) followed by a brief individual interview (5- 10 minutes), followed by eight-weekly classes 2.5-3.5 hours in duration, and an all-day silent retreat during the sixth week of the program (7.5 hrs). The program generally concludes with participant evaluation of the intervention. (Eberth & Sedelmeir, 2012; Grossman et al., 2004; Kabat-Zinn, 1990)

“Formal” Mindfulness Meditation Methods as part of MBSR are a *Body Scan Meditation* - a supine meditation; *Gentle Hatha Yoga* - practiced with mindful awareness of the body; *Sitting Meditation* - mindfulness of breath, body, feelings, thoughts, emotions, and choiceless awareness, and *Walking Meditation.* (Eberth & Sedelmeir, 2012; Grossman et al., 2004; Kabat-Zinn, 1990) These methods are practiced during the intervention guided by a facilitator. “Informal” Mindfulness Meditation Practices practiced at home or in everyday life are awareness of pleasant and unpleasant events, awareness of breathing, deliberate awareness of routine

activities and events such as: eating, weather, driving walking, and awareness of interpersonal communications.

Daily home assignments include a minimum of 45 minutes per day of formal mindfulness practice and 5-15 minutes of informal practice, 6 days per week for the entire duration of the course. Individual and group dialogue and inquiry oriented around weekly home assignments including an exploration of hindrances to mindfulness and development and integration of mindfulness- based self-regulatory skills and capacities. Lastly, exit assessment instruments and participant self-evaluation are incorporated in the last course. For a typical MBSR intervention, total in-class contact is 30+ hours, total home assignments is a minimum of 42-48 hours, and total group orientation session time is 2.5 hours. (Eberth & Sedelmeir, 2012; Grossman et al., 2004; Kabat-Zinn, 1990)

MBSR is hypothesized to impact anxiety by changing the individual's relationship to thoughts (Teasdale, Segal, & Williams, 1995). Teasdale et al. (1995) suggest that mindfulness allows adults to take a decentered approach to thoughts that elicit worry and panic, meaning anxious thoughts become temporary and are no longer viewed as reflections of reality. For example, thoughts can be seen at transient; they come and go, and are not a static part of one's identity (Teasdale et al., 1995). In turn, this leads to reductions in rumination and increases in emotional regulation (Lykins & Baer, 2009; Ramel, Goldin, Carmona, & McQuaid, 2004; Teasdale, Segal, & Williams, 1995). As a result, mindfulness gives individuals the ability to learn to identify and manage their feelings of anxiety and react to them effectively. (Hazlett-Stevens, 2012) These findings support the hypothesis for how MBSR can impact anxiety, however, there is limited research on the relation between the two variables, and while studies have shown positive

results on anxiety, it is not yet recommended as a first line of response to treat such conditions. (Gotink, 2015) We therefore cannot infer that MBSR would reduce stress or anxiety associated with poverty completely.

The objective of this paper is to review the literature on MBSR interventions that have been conducted amongst low socioeconomic status individuals and racial or ethnic minorities. The current literature on mindfulness interventions with these populations is limited, and this paper seeks to discuss the best practices and recommendations for conducting MBSR interventions in low SES settings.

Methods

Literature searches were conducted in PubMed, PsycINFO, and EMBASE. Twenty articles were identified from the search. Of these, eight were identified to not be MBSR, and the remaining twelve articles were included in the literature review.

The PubMed yield was 237 citations. This PubMED search was conducted on February 23rd, 2019.

Searches of PubMed were constructed as follows; ((mindful[tw] OR mindfulness[tw] OR "mindfulness" OR "Mindfulness Based Stress Reduction" OR MBSR)) AND ("Socioeconomic Factors"[Mesh] OR "Socioeconomic Factors/adverse effects"[Mesh] OR "Poverty"[Mesh] OR "Minority Groups"[Mesh] OR "Communication Barriers"[Mesh] OR "Healthcare Disparities"[Mesh])

EMBASE (yield; 110, searched February 22nd, 2019)

('lowest income group'/exp OR 'social class'/exp OR 'poverty'/exp OR 'health disparity'/exp OR 'vulnerable population'/exp OR 'minority health'/exp) AND ('mindfulness based stress reduction'/exp OR 'mindfulness'/exp OR mbsr OR 'meditation'/exp)

PsycINFO (yield 136, search February 23rd, 2019)

(mindfulness based stress reduction OR mindfulness OR mbsr) AND (MM "Socioeconomic Status") OR ("health care disparity")) OR (DE "Family Socioeconomic Level")) OR (DE "Lower Class")) OR (DE "Poverty")) OR (DE "Homeless")) OR (DE "Lower Income Level")) OR (DE "Disadvantaged")) OR (DE "Cultural Deprivation")) OR (DE "Lower Income Level")) OR (DE "Financial Strain")) OR (MM "Minority Groups") OR "minority group" OR "minority groups" OR "low SES" OR "low income" OR "ethnic minority" OR "ethnic minorities"

All citations (abstracts) found by literature searches and other sources were independently screened by JW. All screening was done in the open-source, online software Abstrackr. Relevant studies were rescreened in full text to ensure eligibility. During abstract screening, liberal eligibility criteria was used to minimize the risk of rejecting pertinent studies and then evaluated for inclusion criteria. This process allowed the ability to focus and refine, if necessary, the criteria and the list of pertinent studies. Eight studies were not included after rescreening abstracts for a sample of twelve studies.

All controlled and observational (cohort) studies conducted at single or multiple centers, published, peer reviewed studies of any language, publications published after 1990 were included for consideration. Single arm, non-randomized quasi-experimental to randomized

controlled trials will be included. Exclusion criteria is anyone who does not identify as low SES, or ethnic minority, and has not participated in an MBSR intervention.

The health outcomes measured in this study include health behaviors, mental health, physical health and biomarkers, and the feasibility of implementing an intervention amongst low SES and ethnic minority participants in an Mindfulness- Based Stress Reduction intervention. The participant, intervention, control, and outcome (PICO) criteria for the literature review is as follows.

Participants/ population

All participants self identified in the intervention as low income or low SES, or racial/ ethnic minority, or identified by the interventionist.

Intervention(s), exposure(s)

Participating in an evidence based Mindfulness Based Stress Reduction Intervention or qualitative analysis of MBSR in low income, minority populations.

Comparator(s)/ control

Anyone not currently engaged in MBSR program *i.e. waitlist control, active control, superiority, enhanced usual control, TAU and no intervention (i.e. comparison baseline to follow-up).*

Outcomes

Health outcomes included health behaviors, mental health, physical health and biomarkers, as well as feasibility evaluations for implementing a mindfulness interventions amongst low SES participants.

Results

Twelve peer reviewed articles were included that assessed the acceptability and feasibility of modifying MBSR to low income populations.

Table 1: Intervention Measures and Socioeconomic Status (SES) Classification

	Single Arm Trial	**Randomized Control Trial**
Health Condition		
Mental Health and Physical Health (k=4)	Watson-Singleton et al. 2018; Kabat Zinn et al, 2016; Erickson et al 2016	Fung et al. 2018; Neece et al. 2018;
Child Obesity (k=1)		Jastreboff et al. 2018
Diabetes (k=1)	Palta et al 2012	
Mindful Parenting (k=2)	Mathis et al. 2018	
Anxiety (k=2)	Abercrombie et al 2007;	
Depression (k=1)	Burnett-Zeigler et al. 2016	
PTSD/ Partner Violence (k=1)		Dutton et al. 2013
Blood Pressure (k=1)		Palta et al. 2012
Race/ Ethnic Minority		
Ethnic Minority Status Captured (k=10)	Erickson et al 2016; Watson-Singleton et al. 2018; Burnett-Zeigler et al. 2016; Palta et al 2012; Erickson et al 2016; Abercrombie et al 2007	Fung et al. 2018; Neece et al. 2018; Dutton et al. 2013; Jastreboff et al. 2018

Type of SES		
Income (k=3)	Kabat Zinn et al, 2016; Mathis et al. 2018	Neece et al. 2018;
Demographic Factors (k=5)	Palta et al 2012; Mathis et al. 2018	Fung et al. 2018;Dutton et al. 2013; Jastreboff et al. 2018
Education (k=2)	Kabat Zinn et al, 2016	Dutton et al. 2013

This table lists the health condition measured by study, the type of SES measured in the study (Single Arm Trial, Randomized Control Trial, Clinical Trial) and racial or ethnic minority status of the participants by study.

Health Conditions

The twelve studies addressed many different health outcomes amongst low SES and ethnic minority individuals. Three studies were conducted with low income and ethnic minority parents, with the goal of mindful parenting and various outcomes for the children such as obesity prevention (see Table 1). While some outcomes for mindful parenting included the children, the parents were the primary focus of the MBSR intervention and primary outcome, or mindfulness in parenting, was measured amongst the parent group. One study was conducted amongst low income ethnic minority youth in a school-based setting, and measured both stress and emotional regulation in the youth participants. The remaining studies were conducted with African American and ethnic minority adults and measured mental health, diabetes, anxiety, self-esteem, blood pressure, PTSD, intimate partner violence, and depression. The most commonly assessed health outcomes were mental (n=5) and physical health (n=4). While other studies focused on a number of different of health outcomes, mental health was addressed in nearly every Mindfulness Based Stress Reduction based intervention (k=12).

Measures of SES

Socioeconomic status was also measured or quantified differently in studies. Only a few studies included a robust description of demographic factors assessed such as income, education status and race/ethnicity. (Kabat Zinn et al, 2016, Mathis et al. 2018, Neece et al. 2018, Dutton et al. 2013) Five studies also looked at sociodemographic or neighborhood factors to quantify socioeconomic status. (Palta et al 2012, Mathis et al. 2018, Fung et al. 2018, Dutton et al. 2013, Jastreboff et al. 2018) Income and education level was only recorded in three studies. Most studies used race or ethnic minority status to justify the low SES label and discussed stress from this minority status and a factor for conducting a MBSR intervention amongst the group or population. Three interventions had the MBSR materials translated into Spanish to support the language needs of the intervention population. (Kabat Zinn et al, 2016, Mathis et al. 2018, Erickson et al 2016) All studies captured the race and ethnicity of study participants.

Measurements of Outcomes

The study designs and measured health outcomes differed widely amongst all MBSR interventions included in the literature review. Seven of the studies conducted were pilot trials of the acceptability and feasibility of mindfulness programs in the low SES population of interest, and did not have a control group. Five studies used a randomized control design for the intervention, or clinical trial. Several studies had a mixture of qualitative and quantitative data collected to assess the feasibility and feedback of conducting mindfulness amongst racial and ethnic minority populations.

The school based study with youth used the Short Mood and Feelings Questionnaire Child version, (SMFQ; Angold et al. 1995) and the Patient Health Questionnaire, (PHQ-9; Kroenke and Spitzer 2002) to screen for severe depression and suicidality. Students who endorsed active suicidal ideation and/or received a probable diagnosis of Major Depressive Disorder were excluded from the study and referred for individual therapy through the school district. Other studies used the Five Facet Mindfulness Questionnaire (FFM; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), as well as the Health Survey Short Form 36 (SF36; Ware, Snow, Kosinski, & Gandek, 1993).

The study outcome of blood pressure reduction measured blood pressure using the OMRON HEM-907XL electronic blood pressure machine. While this was a randomized controlled trial, it should also be noted that this was a very small sample size of 20 subjects, where 12 were randomized to the intervention group and 8 were randomized to the social support group. Other studies were not quantitatively measured at all (Dutton et al. 2013) and only included a qualitative follow up measurement to assess the mindfulness training and PTSD amongst women in the study group.

Anxiety was measured using the 20-item state portion of the State-Trait Anxiety Inventory (STAI), which measures anxiety at the present moment. The items for this intervention were translated into Spanish and rated on a scale of 1 to 4. Participants also completed the 26-item Self-Compassion Scale, which elicits responses to questions related to how one acts toward one's self during difficult times, which was also translated into Spanish.

Findings: Quantitative Outcomes

Mental Health

All studies reported improved outcomes in domains such as mental health, which included anxiety and depression, mindful parenting, and parental stress. A study focus on the outcome of depression showed that depressive symptoms significantly decreased from baseline through a 16 week follow up marker. A significant decrease in participant stress and a significant increase in mindfulness was found. Additionally, aspects of well-being and self-acceptance significantly increased from baseline to 8-weeks and all results were statistically significant (Burnett-Zeigler et al. 2016).

In another study depressive symptoms significantly decreased from baseline to 16 weeks. A significant decrease in stress and significant increase in mindfulness was also found. Stigma significantly increased from baseline to 8 weeks and significantly decreased from 8 to 16 weeks (all p's < 0.05). (Fung et al, 2018) A study looking at school based mindfulness amongst ethnic minority youth found that treatment effects of mindfulness were larger among youth with more severe problems at baseline for internalizing problems, externalizing problems, and perceived stress. However, for attention problems, students with lower severity at baseline appeared to have larger treatment gains. The study showed strong evidence that the mindfulness intervention was beneficial for low-income ethnic minority youth in reducing perceived stress and internalizing problems, and improving emotion regulation outcomes. (Fung et al. 2018)

Physical Health

The studies evaluating at parental stress showed evidence consistent with MBSR being an effective intervention. (Jastreboof, 2018; Mathis, 2018) Specifically, in the clinical trial assessing

impacts of mindful parenting on childhood obesity, the intervention group demonstrated significantly better attendance (P <.015), greater improvement in parental involvement (P <.05), and decreased parental emotional eating rating (P <.011). Furthermore, the intervention group showed significant decreases in child body mass index percentile during treatment (P <.03). The findings suggest that a mindfulness-based parent stress intervention to decrease childhood obesity risk is feasible (Jastreboff et al. 2018). Another mindfulness based parenting intervention also showed decreases in parental distress, depression symptoms (p=0.007), autonomy, sleep disturbances, and an increase in parental support (p=0.007). (Mathis et al. 2018)

The study evaluating blood pressure also showed promising results. In comparing the differences between post-intervention and baseline measurements, individuals in the intervention group exhibited a lower systolic blood pressure compared to the social support control group and this value was determined statistically significant ($p = 0.020$). (Palta, 2012) Another study looking at the outcome of diabetes management found that using mindfulness as a biopsychosocial approach for stress-management might help residents in these communities to better cope with diabetes. (Palta et al. 2012)

Other studies with both the outcomes of mental and physical health showed significant increases in both mental (p<.001) and physical health (p<.001) (Erickson et al 2016). Multiple studies concluded that the application and feasibility of conducting mindfulness amongst low income populations is promising and more robust studies should be done. While the quantitative findings, many being single arm trials, were uniform across different types of SES, the qualitative findings showed variations in modifying the intervention to different types of SES and ethnic minorities.

Qualitative Outcomes

Many of the studies used a qualitative component and reported findings from the study group about how mindfulness can be best delivered to them. For example, in the study measuring diabetes, participants stated that the benefits of having a mindfulness-based stress reduction group would provide social support, identify healthy ways to reduce their stress, and improve their overall health (Palta et al 2012).

Other themes that emerged from studies is that many individuals considered prayer or yoga as a type of mindfulness, and practice mindfulness is different ways. One of the advantages of using mindfulness as a stress reduction mechanism is the ability to tailor the practice of mindfulness or mindfulness meditation based on community and individual resources (Watson-Singleton et al. 2018). Another theme identified in a few studies looking at obesity in children and diabetes was the connection between stress and eating. (Palta et al 2012) It was found that individuals would use eating as a mechanism to reduce their stress and the intervention showed promising results for mindful eating. Through MBSR, individuals from low-income neighborhoods might use stress reduction techniques to become more mindful of their diet and find healthier alternatives to managing stress.

Qualitative findings from the studies have also highlighted the importance of translating the entire intervention and all materials into the native language of participants. An instructor that speaks the native language is much preferred to a translator for the intervention (Kabat Zinn et al, 2016). Other recommendations that emerged from qualitative data suggested modifications to the intervention, included using facilitators of the same race or ethnicity as the participants, incorporating cultural values of the study group, using culturally-familiar terminology, and providing cultural resources (Watson-Singleton et al. 2018). Suggested modifications to the

MBSR intervention's external factors included conducting the intervention within culturally-familiar settings to the participants. (Watson-Singleton et al. 2018)

Overall, through qualitative interviews, mindfulness and MBSR interventions were shown to have a generally positive response from participants. While respondents stated that mindfulness programs can be culturally adapted, and are acceptable interventions, there were also numerous suggestions of how to best modify mindfulness interventions to feasibly conduct them amongst diverse populations. Qualitative research can give insight into how mindfulness is perceived and how it can be successfully implemented in different settings.

Discussion

Numerous studies acknowledged that MBSR is a feasible, unexplored intervention that is low cost and customizable to low income or ethnic minority populations. Of the studies that were analyzed, there were small sample sizes, with variable outcomes and measures that made it hard to generalize findings to diverse low SES populations. Multiple studies sought to assess the feasibility of MBSR amongst low income populations, and had promising results. (Jastreboff et al. 2018, Burnett-Zeigler et al. 2016, Dutton et al. 2013, Palta et al. 2012, Erickson et al 2016) Many studies modified the intervention to be culturally acceptable or feasible by interviewing local community members about structure of the program, such as shortening the sessions, and needed translation for participants. This is a useful technique in the initial stages of implementing MBSR in a new area. Findings were positive in all studies, however, while each study had the similar aims, to assess the feasibility amongst low income populations, the outcome or results were measured differently, making it very challenging to compare the studies

methods and results. Some were quantitatively measured and others were only measured using qualitative data.

Another limitation of all studies is the lack of follow up. Change was established from baseline in all trials, however, there was not long term follow up to determine if this change continued over time. There is an opportunity to assess the results amongst mixed gender low income communities on a larger scale by increasing and diversifying the sample size. Additionally, time and resources must be pre-emptively spent assessing cultural adaptations and modifying the study to each subpopulation accounting for language, lifestyle, and limitations of participants. Some barriers to attendance the studies mentioned were child care, lack of transportation, and work hours. Each study would need to assess the needs of participants and how to adapt the session to ensure all can participate. MBSR materials will need to be translated into multiple languages, which might be challenging and time consuming and a consistent method of measurement should be established.

Conclusion

As a relatively low cost intervention(depending on the provider), MBSR has the possibility to greatly impact the health and quality of life for many low income communities, both in the United States and abroad. This first starts with interest or will to expand these interventions to low SES settings, and then modification of the MBSR intervention to meet the unique needs of different populations, communities, and cultures. It would be helpful to have consistent methods of measurement amongst studies, more rigorous designs such as randomized controlled trials, and a larger sample sizes to more rigorously evaluate and interpret scientific findings. The measures as outlined in the traditional MBSR prototype could be a

standard measurement, such as the Five Facet Mindfulness Questionnaire (FFMQ) tool, along with qualitative interviews conducted in the language of the participants. If a member of the local community was involved in the intervention implementation, it would be more realistic to conduct long term follow up and retain participants for the intervention.

More research in needed to explore the benefits low SES populations might gain from MBSR interventions, which could include a better overall sense of well being, improved health and nutrition that would reduce risk of cardiovascular disease, and improved psychosocial health as documented by previous interventions. (Gotink, 2015) Local communities would need to be involved in assessing and implementing the intervention to meet the needs of that specific population and ensure its sustainability. Ultimately, MBSR has been shown to be both acceptable and feasible to implement amongst low income populations. It seems that it is now a question of interest, willingness to modify interventions, and motivation to make MBSR accessible to meet the needs of low SES communities.

References

Abercrombie PD, Zamora A, Korn AP. Lessons learned: providing a mindfulness-based stress reduction program for low-income multiethnic women with abnormal pap smears. Holist Nurs Pract. 2007 Jan-Feb;21(1):26-34. PMID 17167329.

Anandi Mani, Sendhil Mullainathan, Eldar Shafir, Jiaying Zhao**.** Poverty Impedes Cognitive Function. *Science30,* Vol. 341, Issue 6149, pp. 976-980. August, 2013.

Blacker M, Meleo-Meyer F, Kabat-Zinn J, Santorelli S. Stress Reduction Clinic Mindfulness-Based Stress Reduction (MBSR) Curriculum Guide. Center for Mindfulness in Medicine, Health Care, and Society: University of Massachusetts Medical School; 2009. p. 20.

Dutton MA, Bermudez D, Matas A, Majid H, Myers NL. Mindfulness-Based Stress Reduction for Low-Income, Predominantly African American Women With PTSD and a History of Intimate Partner Violence. Cogn Behav Pract. 2013 Feb 1;20(1):23-32. PMID 24043922.

Gallegos AM, Lytle MC, Moynihan JA, Talbot NL. Mindfulness-based stress reduction to enhance psychological functioning and improve inflammatory biomarkers in trauma-exposed women: A pilot study. Psychol Trauma. 2015 Nov;7(6):525-32. doi: 10.1037/tra0000053. Epub 2015 Apr 27. PMID: 25915646.

Gotink RA, Chu P, Busschbach JJ, Benson H, Fricchione GL, Hunink MG. Standardised mindfulness-based interventions in healthcare: an overview of systematic reviews and meta-analyses of RCTs. PLoS One. 2015 Apr 16;10(4):e0124344. doi: 10.1371/journal.pone.0124344. eCollection 2015. Review. PMID 25881019

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144-156.

Kabat-Zinn, J. (1990). Full catastrophe living. New York: Bantam Dell.

Kabat Zinn, J, Fernando de Torrijos, Anne H. Skillings, Melissa Blacker, George T. Mumford, Danielle Levi Alvares, Saki Santorelli, Milagros C. Rosal. Delivery and Effectiveness of a Dual Language (English/Spanish) Mindfulness Based Stress Reduction (MBSR): Program in the Inner City A Seven Year Experience: 1992-1999. Mindfulness & Compassion 1 (2016) 2-13.

Nyklíček I, Mommersteeg PM, Van Beugen S, Ramakers C, Van Boxtel GJ. Mindfulness-based stress reduction and physiological activity during acute stress: a randomized controlled trial. Health Psychol. 2013 Oct;32(10):1110-3. doi: 10.1037/a0032200. Epub 2013 Mar 25. Erratum in: Health Psychol. 2014 Sep;33(9):1045. PMID 23527521.

Palta P, Page G, Piferi RL, Gill JM, Hayat MJ, Connolly AB, Szanton SL. Evaluation of a mindfulness-based intervention program to decrease blood pressure in low-income African-American older adults. J Urban Health. 2012 Apr;89(2):308-16. PMID 22302233.

Roberts L, Montgomery S. Mindfulness-based Intervention for Perinatal Grief Education and Reduction among Poor Women in Chhattisgarh, India: a Pilot Study. Interdiscip J Best Pract Glob Dev. 2016 Apr;2(1). pii: 1. PMID 28357415.

Szanton SL, Wenzel J, Connolly AB, Piferi RL. Examining mindfulness-based stress reduction: perceptions from minority older adults residing in a low-income housing facility. BMC Complement Altern Med. 2011 May 31;11:44. doi: 10.1186/1472-6882-11-44. PMID 21627807.

Erickson et al. The Health Effects of a Mindfulness Intervention Adapted for Hispanic Primary Care Patients. Psychosomatic Medicine 2016 78 :3 (A102).

Watson-Singleton N.N., Black A.R., Spivey B.N. Recommendations for a culturally-responsive mindfulness-based intervention for African Americans. *Complementary therapies in clinical practice,* 2019. 34 (132-138).

Fung J., Kim J.J., Jin J., Chen G., Bear L., Lau A.S. A Randomized Trial Evaluating School-Based Mindfulness Intervention for Ethnic Minority Youth: Exploring Mediators and Moderators of Intervention Effects. *Journal of abnormal child psychology* 2019 47:1 (1-19).

Jastreboff A.M., Chaplin T.M., Finnie S., Savoye M., Stults-Kolehmainen M., Silverman W.K., Sinha R. Preventing Childhood Obesity Through a Mindfulness-Based Parent Stress Intervention: A Randomized Pilot Study. *Journal of Pediatrics* 2018 202 (136-142.e1).

Mathis E.T., Shapiro A., Hawkins J.T., Charlot-Swilley D., Lingo K.J., Spencer T., Trachtenberg D., McPherson S.K.L., Domitrovich C.E., Biel M.G. Cultivating Mindfulness in Parents of Young Children: Effects of a Mindful Parenting Intervention Pilot in a Low-Income Community. *Journal of the American Academy of Child and Adolescent Psychiatry* 2018 57:10 *Supplement* (S148-).

Mathis E.T., Robertson H.A., Domitrovich C.E., Hawkins J.T., Biel M.G. Training in mindful parenting skills: A feasibility pilot with effects on mindfulness, mood, and parenting in a low-income sample. *Journal of the American Academy of Child and Adolescent Psychiatry* 2017 56:10 (S154-S155)

Burnett-Zeigler I.E., Satyshur M.D., Hong S., Yang A., T Moskowitz J., Wisner K.L. Mindfulness based stress reduction adapted for depressed disadvantaged women in an urban Federally Qualified Health Center. *Complementary therapies in clinical practice* 2016 25 (59-67)

Part II: Qualitative Research Study

Examining Access and Interest in Mindfulness Based Programs Within Low Income Communities In Providence, RI

Introduction

Mindfulness-based programs (MBP's), such as mindfulness based stress reduction (MBSR) and mindfulness based cognitive therapy (MBCT) have markedly grown in popularity in recent years.

According to the National Health Interview Survey, mindfulness meditation practices in the United States more than tripled from 2012 to 2017 (Clarke et al, 2018). Recent research suggests that mindfulness, or paying attention on purpose to the present moment in a non-judgmental way, may be a critical pathway towards increasing self-regulation of health behaviors, such as reducing alcohol consumption, increasing physical activity, and promoting medication adherence, in addition to reducing stress and relaxation, which could lead to improvements in quality of life (Kabat- Zinn et al, 2016).

Mindfulness has been described as a process of bringing a certain quality of attention to moment-by-moment experience (Kabat Zinn, 1990). In an effort to operationalize a definition of mindfulness, another two component model of mindfulness has also been proposed. The first component includes self regulation of attention, which is maintained on the immediate experience, allowing for increased awareness of mental events in the present moment. The second part involves adopting a particular orientation towards one's own experiences in the present moment, that is characterized by curiosity, openness, and acceptance (Bishop et al. 2004).

While mindfulness is a growing field with promising results, many mindfulness based programs have non diverse samples, and have not reached communities or individuals of low socioeconomic status. Socioeconomic status is defined in terms of education level, housing status, income at or below the federal poverty line, and occupation. As MBPs have shown positive results in reducing stress, helping with emotion regulation, and increasing awareness, this practice has the potential to be beneficial in improving quality of life, or reducing stress for low SES populations. Other research studies have found that these low SES individuals suffer from residual concomitant psychosocial stress and poverty (Adler et al. 1994). There are many

aspects of MBPs that are not well understood, and qualitative research into the acceptability and feasibility of these programs is important for MBP implementation. MBP's could be a beneficial tool for this population as it is relatively low cost, depending on the provider, and the practices can be done at home by the participant. It is a self sustaining practice that can be continued long after the intervention and modified to the participants individual needs.

The purpose of this study is to explore interest in mindfulness based interventions and the barriers to access these interventions amongst low socioeconomic status (SES) individuals in Providence, Rhode Island. A qualitative study was conducted to capture the rich content and detail of the thoughts, ideas, and comments regarding mindfulness based interventions amongst the population of interest. The purpose was to allow for a deeper analysis amongst low income individuals regarding what types of mindfulness based programs they might be interested in, and how they would best be delivered.

Objectives

The objective of this study is to understand levels of interest in mindfulness overall, and more specifically, interest in participating in specific mindfulness delivery systems (e.g. in-person, online, app, flipped classroom), amongst low SES communities in Providence, Rhode Island.

Methods

A demographic characterization of the population is provided in Table 1. An interview guide was developed to conduct individual interviews. Participants were recruited through low income housing sites in Providence (n=5), at various bus stops in downtown Providence (n=5), the Rhode Island Community Food Bank (n=4), and lastly at a homeless shelter (named Crossroads) in Providence, RI (n=5). One additional participant was recruited using the snowball sampling method, so that the sample included an equal number of diverse males and females. Interviewees were approached in person by the interviewer and asked if they would like to participate in a study on mindfulness. Of those approached, 5 were not interested in participating, and 20 agreed to participate in the interviews. A relationship with the interviewees was not established prior to the interview. A hispanic female participant who was interviewed at a low income housing site was asked to provide additional contacts to give access to a network of hispanic males. The participant contacted a Hispanic male through text message to see if he was interested, and one he confirmed, JW contact the participant to set up an interview, which took place in Memorial Park in Providence, RI. All other interviews were conducted in the setting in which the interviewee was approached.

Interview questions were created (see Appendix 1) to investigate perceptions of mindfulness, and interest in participating in a mindfulness intervention. In addition, the interviewer inquired about types of mindfulness based programs and preferences asking participants to identify interest on a Likert scale of 1 to 10. Participants were also asked about accessibility to interventions, transportation, length of interventions sessions, and language of the interventions to assess limitations of the interventions in meeting the needs of this demographic.

The two interview criteria were self disclosed: low socioeconomic status, measured by asking participants to complete a demographics questionnaire, and interest in discussing mindfulness with the interviewer. Participants were given a $10 gift card upon completion of the interview and demographic questionnaire. Qualitative interviews were all audio recorded with a Google pixel phone, de-identified for participant confidentiality, and transcribed verbatim. All interviews were conducted and transcribed by the study author (JW). All research measures were approved by Brown University's Human Subjects Institutional Review Board.

Analysis

Codes were created *a priori* from the interview questions by JW and modified once the interviews were transcribed. Codes were further refined using conventional theory as well as themes from the interview guide to investigate acceptability/ feasibility, and understand participants' thoughts around mindfulness. Transcribed interviews were then double coded by another member of the research staff (WN) using a structured, consensus-driven process. An audit trail was maintained throughout the entire interview and coding process that included the original interview questions, ideas of themes, interview follow up thoughts, and plans for dissemination of interview content. Themes and coding were discussed by JW and WN when any discrepancies arose. The group including the PI and qualitative expert then met to discuss interpretation of the data and major themes, including both *a priori* and emergent themes.

Interviews were transcribed in a Google document and then uploaded to NVivo version 11, which was used to code and sort themes from interviews. All interviews were double coded in NVivo using *a priori* themes from the interview guide and there were over twenty codes that

emerged from the transcripts. Participants were not asked to provide feedback regarding research findings.

Results

The mean age amongst participants was 45 years. All participants with the exception of two had a high school education level or below. Breakdown of demographics of the 10 men and 10 women, is 6 white, 8 black, 2 latino/ hispanic, 1 Native American, and 3 identified as Mixed Race/ Black (see **Table 1.)**

Table 1. Summary of Demographic Information

Variable	N (%)
Participant (n)	20
Age (years)	45
Gender, n (%)	
Male	10 (50%)
Female	10 (50%)
Housing, n (%)	
Homeless	3 (15%)
Living in a shelter	5 (25%)
Low Income Housing	10 (50%)
Renting	2 (10%)
Occupation, n (%)	
Unemployed	15 (75%)
Employed Full Time	1 (5%)
Employed Part Time	2 (10%)
Retired	2 (10%)
Education Level, n (%)	
Did not finish High School	4 (20%)
High School Graduate	11 (55%)
Some college	3 (15%)

Two Year Degree	2 (10%)
Race/Ethnicity, n (%)	
White	6 (30%)
African American	8 (40%)
Mixed Race	3 (15%)
Native American	1 (5%)
Hispanic	2 (10%)

Theme I: Respondents have varied responses to what mindfulness is and overall a low understanding of the term mindfulness.

Participants had varied ideas of what they believed mindfulness was, and many were inconsistent with research conceptualizations. One quarter of participants had not heard the word, and did not know what it was. The definition of paying attention, on purpose, in the present moment, non-judgmentally was provided to participants. It was still hard for them to conceptualize mindfulness even after the interview and seemed like they needed a more tangible example of mindfulness in practice. One participant translated the word from Spanish to English to help her explain what it meant.

There was some association of mindfulness conceptualization with intelligence, education, and cognitive ability amongst respondents, as one participant stated, *"Yeah, I mean why would you (participate in mindfulness) if you don't know what it is? It would help to explain what it is, I think that is the only way people are going to be more attracted to it. They don't know what is is. Unless they are like smart, smart, smart and they are like oh yeah. But other than that I mean probably finding a different way of coming with it, coming out with it. That's probably what turns people off, is that they don't know what it is"*

Another participant spoke to the challenges of understanding the language used around mindfulness, *"Yeah it could be (the language), that is what I am saying if people don't understand it then that's the reason they are like no, I don't want to talk to you, that's no for me, I don't understand. (laughs) That is way above me, smart people"*

Yet another participant associated mindfulness with intelligence and social cognition, stating, *"It means intelligence. It means a smart person. Intelligence, like me and you is talking right? You ask me a question and I can comprehend what you are talking about."*

A respondent used the term smart and associated it with personal characteristics and how the mind works. *"Um, depends how the person is, nice, lovable, some people are smart, it's the way their mind works and I try to work with them."*

Many participants did not know the term mindfulness, and when asked, "What do you think of when you hear the word mindfulness?", came up with an idea about the brain or using the brain. *"Would it be like using your brain, or? Probably like thinking more? That's how I would see it."*

Another respondent was unsure of the term, but it made him think of acquired knowledge. In response to what mindfulness makes him think of, he stated,*"Books, it means a lot of input"*

The most common response to this question was the mind, thoughts, awareness, and one's surroundings. Given this association, people are interested in this topic, and desire to be kind to others and aware of their surroundings, but might not connect mindfulness to physical health

otherwise. Some associated mindfulness with kindness, being a good person, and respecting others, such as this participant, *"I think of the thought process. You know actually um, being aware of your surroundings, you know being mindful of the people, being mindful of your community, being mindful of you know your parents, your upbringing, things like that remind me of the word mindfulness."*

Being mindful of others was a logical response to what they think of when they hear the word mindfulness. Another responded,*"Um, I think of my surroundings, what people think, how people act, um, aware of myself, self-awareness. Um, how I treat people and I how I treat life just in general."*

A few participants associated mindfulness with attention and thoughts*, "I think of thoughts. Attention. That's it."* Still another respondent mentioned the mind and thoughts, *"The mind and thinking. Yeah, just the mind"*

Others associated it with religious notions such as the 10 Commandments, *"I know what mindfulness is. Have you ever heard of the 10 Commandments?"*

Another participant thought of attention, particularly when interacting with another person, *"I can tell you now, when I hear that word it's like if you pay attention to somebody or something, it's something like. For example if you talking with somebody, um, it's like a (pause) how do I explain you. If you talking with somebody you have to pay attention it's like uh, you have to keep like, it's something like deep."*

Lastly, one respondent thought of feelings and personal experiences when he heard the word mindfulness, *"I think of different experiences, expressions, and uh, feelings, like of a person"*

Overall, each person had their own idea of what mindfulness is, based on their life experience or previous experience with mindfulness or meditation. The sample overall did not have a good understanding about exactly what mindfulness is, nor how one would practice mindfulness. One participant suggested that the word mindfulness should be clarified for a better understanding, and raised the point about lack of engagement with something if you don't know what it means. The variability in responses shows that there is not a clear understanding of the word.

Theme II: There was mixed interest in mindfulness overall amongst respondents, some having interest in mindfulness and others not interested. Respondents also had varied previous experience with mindfulness.

Interest in mindfulness and mindfulness-based programs was mixed amongst respondents. Of those recruited from the street and shelter, 90% did not have basic needs met, and because of this, were less likely to want to participate in a mindfulness based program, regardless of interest in mindfulness. As such, mindfulness training was not prioritized as highly as literacy, finding shelter, and accessing food. They indicated fulfilling these basic needs and managing adverse life circumstances are a barrier to participating in mindfulness. Self reported interest in mindfulness was measured using a Likert scale, where the respondent rated interesting in mindfulness from 1-10, one being no interest in mindfulness, and ten being very interested (Figure 1).

When asked about his interest in mindfulness, a participant from the shelter stated, *"Yes I do, I mean I do think that is important (mindfulness) but I have to sleep somewhere and make money. You know, I have a 10 year old son, he's just in school, he is with his mom right now but we are separated, I'm between jobs, but hopefully things will get better, you know what I mean?"*

Another interviewee that was living on the streets responded, *"I don't know...I would be interested (in mindfulness) but again, certain circumstances prevent me, you know what I mean, currently it's a priority list, you know, certain things have to be at the top all the time, like housing, food."*

Yet another participant that was living at the shelter stated, *"(You)Couldn't get me there, I just got a lot of other stuff going on. My focus right now is to take care of my family, my wife, my son, I have custody of a seven year old too, we were evicted unlawfully, so we are stuck here (shelter). I mean, if we could better this world in any way it's a good thing. I'd like to learn more about it if it could make me a better person."*

A woman recruited from the street said, *"I could say a lot about it, yeah, but right now I need a job, I need a place to stay, I need bus fare to go to Boston. I got other things I need to worry about."*

When asked to rank interest level in mindfulness, one participant staying at the shelter stated, *"I am going to be honest with you, a seven, only because I have other areas of my life, like I go to*

treatment at the Providence Center, but it's just a matter of flexibility and schedule, I have things that are important right now, but I'd be a ten."

Overall, there is interest in mindfulness in a proportion of participants, but the concept remained confusing and unclear. Some were not interested in mindfulness at all based on previous experience with meditation, or they do not think that it would apply to them and be helpful in their life. Those interested have varied responses about the best way it could be delivered to them.

Figure 1; Self Reported Interest in Mindfulness

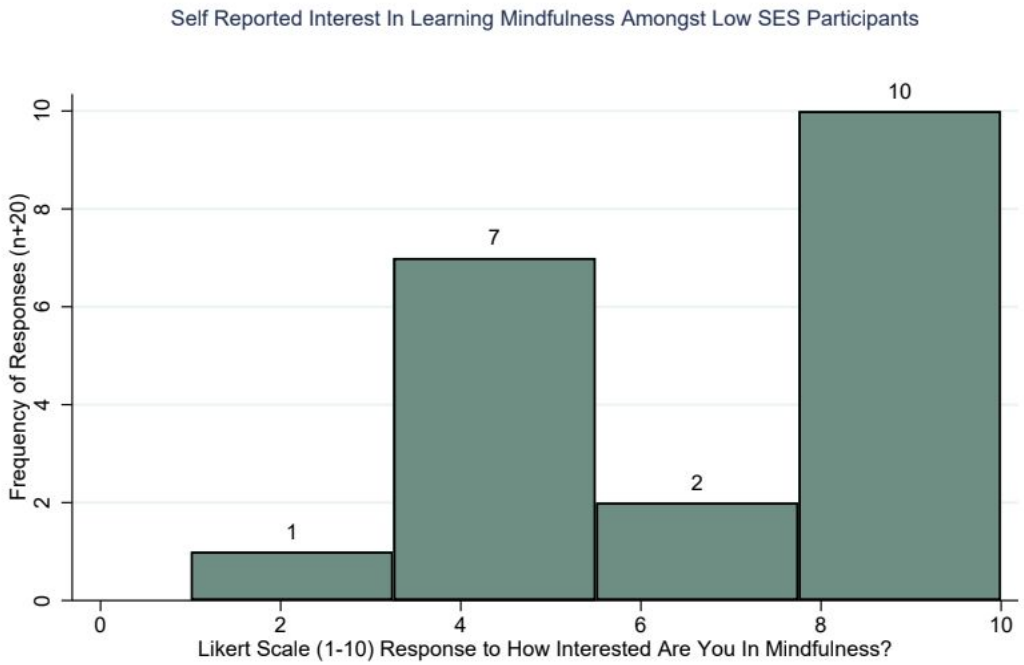

Fig. 1 Graphs responses on a Likert scale from 1-10 for the question participants were asked, "How interested are you in learning more about mindfulness?"

The five respondents who had previous experiences with mindfulness, or associated it with meditation and present moment awareness, gained experience either through a religious/spiritual practice or through a 12 step program. Those who had previous experience with meditation and mindfulness had mixed interest in mindfulness based programs, based mostly on their preferred style of learning and also their current life situation. Regardless of existing religious affiliation, or lack thereof, participants indicated they were interested in mindfulness, and that religious affiliation or personal belief system was not a deterrent to participating in mindfulness based programs.

One person mentioned interest in mindfulness, stating her faith was also really important to her. *"I am interested, I mean, it's not like I am compulsive about it, but I am definitely interested. It sounds like a positive thing to um, learn more about. I mean, it sounds like it could be a positive thing in my life. I mean, my faith is also really important to me, so I would prioritize that and other things, but I am interested in it."*

Another respondent has mindfulness mixed in with his religious practices, however his current circumstances prevent him from practicing, *"Well I'm pagan, so I, well is used to, but I don't practice as much now because I'm homeless, in terms of what I can do and what's around, but yeah, ritual meditation, ceremony, you know"*

Yet another participant was an atheist, but is not interested in a personal mindfulness practice. *"I am an atheist, but that doesn't mean I am not spiritual, you know, I just prefer the individual personal interaction, but uh, somehow I am just kind of divorced from that whole (group*

mindfulness) business, I don't know why. That is just one of those things I just never did, for one thing I just can't do it. I wouldn't want to do it, but I just can't do it because I am here and there and I'm just thinking of everything all the time and I like being like that"

Participants who had previously heard of mindfulness, generally associated mindfulness with meditation. A few expressed they were not interested in meditation, they found it boring, and had negative experiences with it, which may impact feelings on mindfulness. Some expressed that it was just not for them and they had no interest in sitting with their eyes closed or quieting their mind. It was not a priority for them or something they thought was interesting. This association with meditation and previous experience with meditation might interact with the respondents overall interest in mindfulness. Additionally those that reported interest in mindfulness might actually just be interested in getting more information about what mindfulness is, not necessarily in practicing mindfulness meditation.

Theme III: The majority of respondents perceived minimal benefit of mindfulness training. Some saw benefits for social relationships, and others for self awareness and cognitive benefits, but participants did not see the physical and health benefits of mindfulness.

It is important for participants to view mindfulness as beneficial to them if they are to participate in mindfulness programs. When asked, "How would mindfulness benefit or help you?" many respondents stated the desire to help others, and were interested in learning something that would in turn allow them to be helpful to people around them.

When asked how mindfulness would benefit her, one participant responded that she would be able "*to teach other people*." A few other respondents also verbalized the desire to learn about mindfulness which would then help other people. Given this association with being mindful of others, people are interested in this topic, and desire to be kind to others or aware of their surroundings, but might not connect mindfulness to physical health. *"Um, (pause) I think um, general awareness and it might help me to prioritize a little bit, to be more mindful and aware or certain, any situations."*

Participants verbalized mental or emotional benefits, mostly in regards to social interactions and relationships with others, which they valued highly. *"When you pay attention to that person, or you focus on that person, you can check out exactly what is their intention, what they are trying to tell you. Because you don't know."*

Those that were interviewed from the street or shelter also mentioned how mindfulness would help others see their situation and not make judgements about their life circumstances. The main benefit to them is that it would be something positive for them to do, rather than being on the street. They are interested in anything that would improve their circumstances and be positive. *"Cause I am all about positivity. I know this is not a positive thing, to me it is because I am not hurting no one, and no one is hurting me, you know because, being positive I think being positive is like people come by and they hand me something that is fine, if they don't I don't get an attitude, I stay positive, I stay focused and inspired because the next person, you never know, the person that help me"*

One participant saw the benefit of having something to occupy his time, *"Some people take to the phone because it is on the go, you know what I am saying but like I said, I really am not having anything to do, just sitting around doing nothing, I would rather sit there and do something, you know what I mean and learn something."*

Another participant struggled to understand what mindfulness was and saw the only benefit is helping him to become literate, *"I don't understand certain things, I am not literate. And I only know how to read a little bit, I really don't know how to read, I stopped at the 8th grade. I want to learn."*

When asked about the perceived benefits of meditation only a few participants could state what they thought would be the positive benefits of meditation. Some could verbalize benefits such as setting clear goals, clarity of mind, however a majority of respondents could not state how they would benefit from practicing mindfulness or how it would apply to their life. There seems to be an understanding of the impact on mental well being, but not the impact on physical health. *"I think I could set more boundaries for myself, be a little more aware of what is out there, like anything that could harm somebody or actually you know um, change your pattern, you can get lost in that type of situation, where you are moving from one route, like suburbs to the city and so on and so forth."*

One participant had practiced mindfulness meditation previously and saw no benefit to the practice, *"Nah, I close my eyes I go to sleep. I'm not sitting in a room with my eyes closed."*

Another respondent stated the benefit of mindfulness as relaxation, *"It might help me relax a little bit more"*

Other saw no benefit to practicing mindfulness and are likely not to engage with it, *"How would it help me? No, it wouldn't benefit me. Maybe in certain ways, but ways I can't explain. I don't know how to explain it."*

A woman when asked how mindfulness might benefit her stated, *"It probably could (benefit me) if I could do it or if I had any interest in it."*

One respondent had experience with mindfulness through a 12-step recovery program and saw it as beneficial for his recovery, *"You know, I kind of nod off, I am in recovery, so I have been sober for like 5 months so I am trying to get my mind back, back and sometimes I just go off" (benefit of paying attention)*

Participant feedback indicated some interest in mindfulness but, acceptability is still in question for those who fall into the low SES category, especially for participants who struggled to meet basic needs, the feasibility of mindfulness programs was not clear. Few could state the benefits of mindfulness or how it would help them in their lives and no participants connected mindfulness to broader health outcomes. The biggest stated benefit of mindfulness was better awareness of things around them or improved social relationships. The term mindfulness may need to be clarified more to foster an understanding of the potential health benefits that can be gained from the practice.

Theme IV: Participants' preferences vary with methods of delivery for mindfulness interventions (content, type of instructor, type of delivery, etc), based on each individual learning style and current life circumstances.

Mindfulness intervention preferences varied amongst respondents. When asked about access, only 5 out of 20 participants reported having a computer or access to a computer, and 7 did not have a phone or access to a phone. While they might be interested in learning about mindfulness by computer or apps, access to resources is a barrier in participation for these types of interventions for low SES individuals. Additionally, 5 respondents voluntarily stated they were not app friendly or did not have experience using apps. Those who preferred using an app stated they preferred learning on their own, had transportation or time concerns, and it allowed them to practice mindfulness in their own time or when they wanted to.

Many respondents were hesitant about the group setting and the set class structure of the 9 week course, stating that they didn't like the group dynamic or that the 9 week class structure would not fit into their schedule. Five respondents did like the group structure of the course and rated their interest as a 10, and those that responded favorably to the 9 week structured course, were less interested in learning about mindfulness by app or computer. Another group of people were interested in the course, however, they had other life circumstances that prevented them from attending, such as lack of transportation, work schedule, not having a permanent home and seeking shelter at night, or currently participating in a treatment program. Any combination of learning mindfulness by computer or app, given they have access to it, would be an alternative to attending the course. Most respondents could access the library if they were interested in learning by computer.

Some were more interested in learning independently, while others were more interested in the group aspect. Overall, the respondents had different learning preferences. A few participants expressed more of an interest learning one-on-one with a therapist, reading a book or watching a movie to learn about mindfulness. Others liked the group aspect of the course and wanted the group support, along with the accountability that comes from the group structure and a set time to meet each week. Below are the Likert scale results of responses for mindfulness and all mindfulness based programs that were surveyed in the qualitative interviews. It should be noted that some results may be inaccurate as respondents picked an arbitrary number in response to the Likert scale questions that might not have meaning.

Figure 2. Self Reported Interest in Learning Mindfulness by App

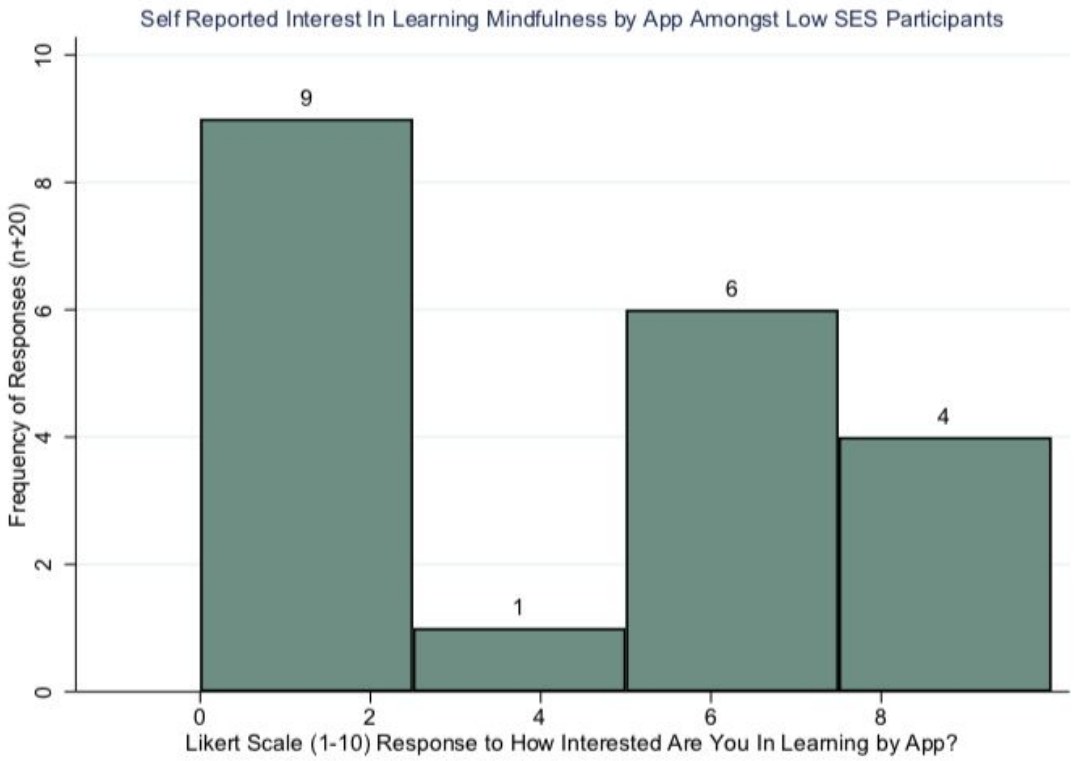

Fig. 2 Graphs responses on a Likert scale from 1-10 to the question participants were asked, “How interested are you in learning mindfulness by app?”

Figure 3. Self Reported Interest In Learning Mindfulness by MBSR

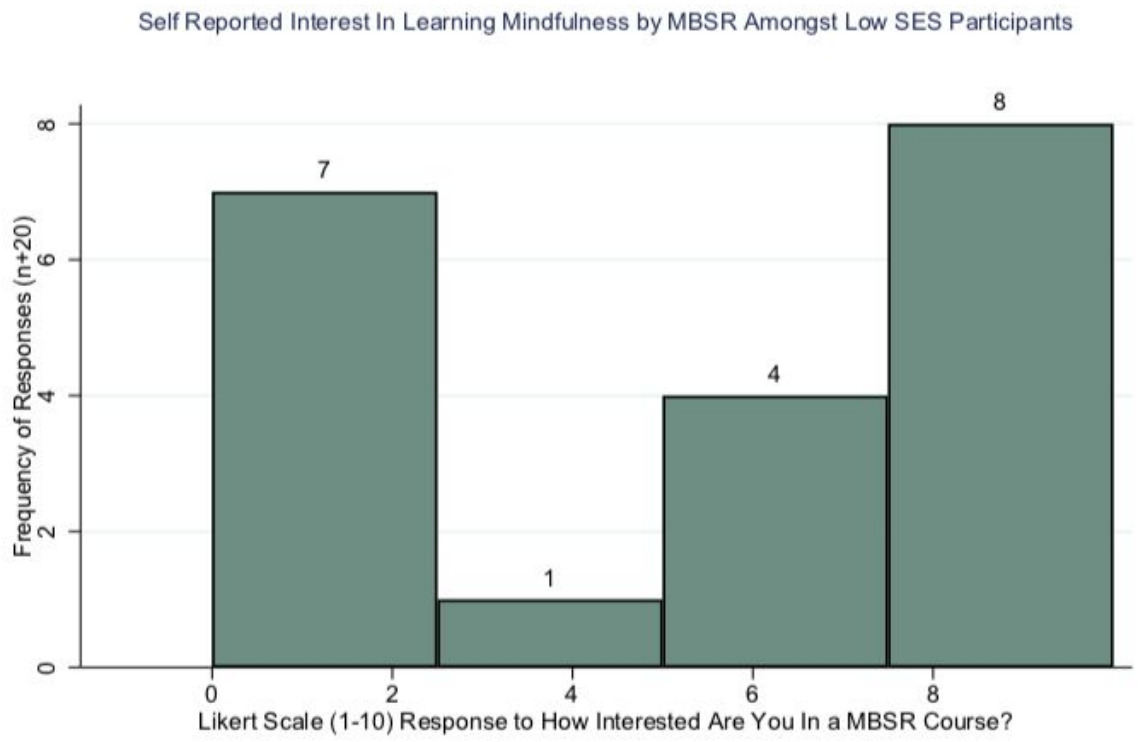

Fig. 3 Graphs responses on a Likert scale from 1-10 to the question participants were asked, “How interested are you in participating in a MBSR course?” MBSR and the course description were first explained to the interviewee.

Figure 4. Self Reported Interest In Learning Mindfulness by Computer

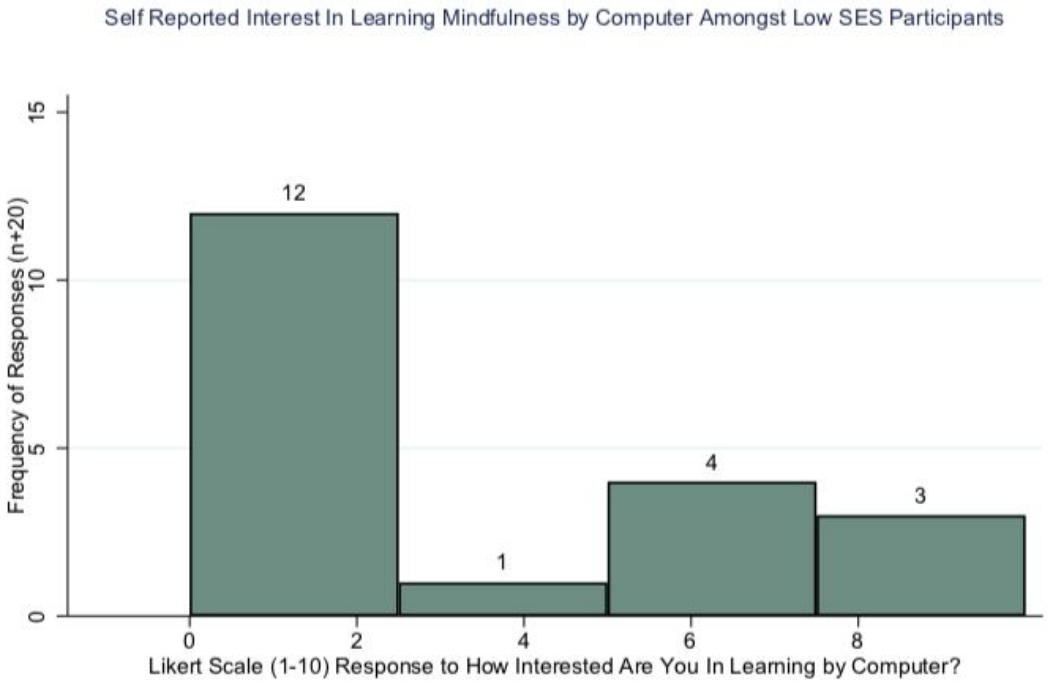

Fig. 4 Graphs responses on a Likert scale from 1-10 to the question participants were asked, "How interested are you in learning mindfulness by computer?"

Figure 5. Self Reported Interest In Learning Mindfulness by Flipped Classroom

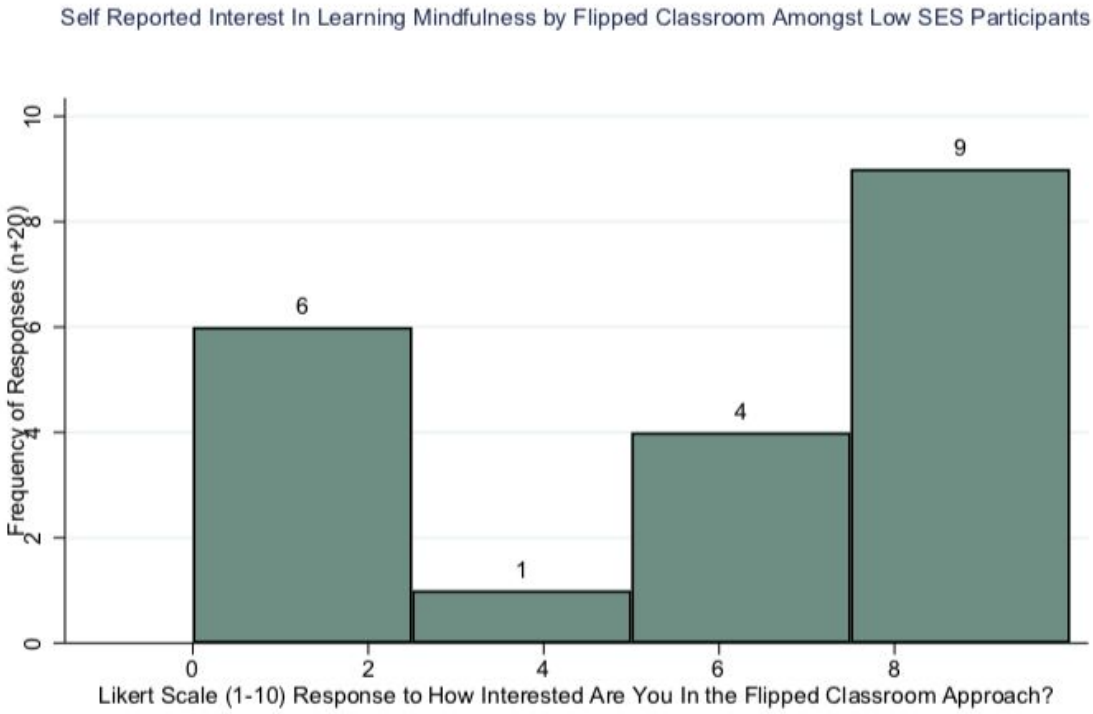

Fig. 5. Graphs responses on a Likert scale from 1-10 for the question participants were asked, “How interested are you in learning mindfulness by flipped classroom?” The concept of a flipped classroom was explained before the question was asked.

All participants stated that language is extremely important. It is pertinent that they have an instructor that speaks their own first language and they need to be able to understand the language to participate in the intervention. While the language of the instructor was expressed to be very important, the instructors' race or ethnicity was not. All participants also stated that the race or ethnicity of the instructor did not matter to them. A few respondents did state that mutual respect and understanding is important, but that race does not matter.

Transportation is extremely important in ability to participate. Most participants rely solely on public transportation and ability to travel to the intervention was a big factor in the decision to participate. Many expressed that it would be ideal if the program was near them or even in their building to make it easier for them to participate. For those living in a shelter, most expressed that it was challenging to move around or attend events regularly because they might stay in a different place each night. Overall, all participants agreed that transportation was extremely important and would influence their decision to participate, *"Um, again to get around back and forth to where they are in person is hard you know, staying in a shelter, just getting to a shelter at night is hard, you know."*

Another participant stated when asked about transportation, *"I mean, I am not going to pay to go there, I can't afford it. I need a bus pass or something"*

Still another interviewee, when asked if she had transportation said, *"Well no, the bus, but it don't always come and I've never had my own car, I need glasses, I can't drive, you know?"*

Consistently, transportation seemed to be a hindrance to participation in a mindfulness based program that is not within walking distance or on the bus route*, "Well I don't have transportation right now, I take the bus, so"*

Those not interested in mindfulness and learning more about mindfulness, do not want to participate in classroom learning. They put more value on life experience regarding mindfulness and awareness. When asked about why they value this, or where they learned what they currently know about mindfulness, they often responded by stating they learned it from their upbringing or life experience. All have stated that classroom learning is not the preferred learning style and that life experience is valued more. *"Oh, okay, I'm aware of stuff around me. I gotta be, but it's not something I can learn in a class."*

When asked about how he learned about mindfulness, one participant stated,*"I do that already, I mean I already know how to do it, to be mindful. I learned it through my upbringing. I have a loving family that taught me well. My mom instilled those values in me. I am lucky to have learned that growing up."*

One participant stated that he already was mindful of others when asked if he was interested in learning more about mindfulness,*"I am interested in learning more about it, but I pretty much think I try to be mindful of others"* This informs us that mindfulness is consistent with his values, however he views mindfulness as something he already does, which is being mindful or considerate of other people.

Another respondent also stated that they learned mindfulness through their life experience and upbringing, *"Well, the way I was raised, my mother was, was very, uh, a good mother and raised me to uh to care for others. Cause, the way I look at it, the word is, well, what I believe is, you do unto others, as you would want them to do unto you."* He attributes his ability to be mindful to his upbringing and his faith.

There is some interest in the flipped classroom, because it is a shorter amount of time, and participants do want feedback. However, many explained they don't' have a computer or phone, so that would be challenging to adopt this model. The flipped classroom was regularly rated higher as it combined many ways of learning, and feedback on their experience from an instructor or a teacher in person was important. Overall, this combined model would accommodate different learning styles and work better for those that find it challenging to attend a longer session in person each week.

Many respondents that were recruited from the shelter or from the street also expressed interest because it was something for them to do. They want to do something and stated that it would be better than what they are doing now, which is asking for money on the street or sitting on the street or in a shelter. Men that are interested but either homeless or in a shelter rated apps high because they can use it anywhere, anytime (given they have a phone). Going to a class is hard as they don't know where they will be from night to night and it's hard to plan in advance. *"Because I have my phone with me wherever I go and it's just that I can sit anywhere, in a coffee shop or wherever in the library or even on a corner, just messing with my phone and doing it"*

When asked if the sessions were too long one respondent stated, *"No, not to me. I can go all day, because it is something for me to do."*

Another participant mentioned that practicing mindfulness would give him something to do since he is out on the streets, *"No because, if I am out here, if I'm out here doing nothing, I can be in there doing something, you know what I mean? Something that is going to be creative and helpful in the future, you know?"*

Discussion

Overall, there was a lack of understanding of what mindfulness is amongst these respondents with low income, which could also be linked to education level. All participants, regardless of interest in mindfulness, stated that the race or ethnicity of the instructor did not matter. All participants would need the program to be conducted in their own first language or need a strong foundation in the language of the course for it to be effective. All participants also expressed that transportant was extremely important and many are unwilling or hesitant to travel far on public transportation to participate in a mindfulness program. Regardless of religious affiliation or beliefs, participants validated the acceptability of mindfulness. Religious beliefs to include agnostic or atheist beliefs did not have an impact on interest in mindfulness. While many participants did find mindfulness interventions acceptable, the feasibility of participating in a mindfulness intervention if basic needs are not being met is questionable. The intervention might not be feasible for those who do not already have their basic needs met, such as shelter and food.

Apps for mindfulness can be useful for those who prefer to learn on their own or outside of a classroom or group. This technology can include people who may not be able to physically make it to an in person session, or do not have the time to dedicate over two hours a week for a mindfulness class. Apps also can allow the user to move at their own pace through the material or practice mindfulness when they feel like it. Computers can be used in the same way, however they are not as mobile compared to using apps. Some limitations of using apps or computers for low SES participants is access, as many do not have access to a phone or a computer, and still more are not familiar with apps or do not have computer skills.

Perhaps one of most interesting findings about the flipped classroom approach to learning mindfulness, was that many respondents wanted feedback from a teacher, even though they were not interested in the group dynamic or reported having transportation concerns with making it to a structured 9 week course. Overall, participants stated the biggest benefit, if they saw any benefit at all, would be improved social interactions and perception or awareness of social interactions. Multiple methods of practicing mindfulness can be offered to include all interested in mindfulness, regardless of learning preference or access to resources.

Previous literature has similar findings, in that the intervention should be culturally appropriate to the participants in low income settings. For example, recommendations that emerged from qualitative data in other literature suggested modifications to the intervention, which included using facilitators of the same race or ethnicity as the participants, incorporating cultural values of the study group, using culturally-familiar terminology, and providing cultural resources (Watson-Singleton et al. 2018). One study looking at MBSR with the outcome of diabetes management in a low income setting found that through MBSR, individuals from low-income neighborhoods might use its stress reduction techniques to become more mindful of their diet

and find healthier alternatives to managing stress. (Palta et al. 2012) Participant feedback from the intervention noted that because they were stressed and tired, physical activity was not a primary mechanism to cope with stress. Participants identified the benefits of having a mindfulness-based stress reduction group, which would provide social support, identify healthy ways to reduce their stress, and improve their overall health. The intervention concluded that using mindfulness as a biopsychosocial approach for stress-management might help residents in these communities to better cope with diabetes. (Palta et al 2012)

Another study examined the efficacy of a school-based mindfulness intervention on mental health and emotion regulation outcomes among low income and ethnic minority adolescents in a waitlist controlled trial. (Fung et al. 2018) This study found that the mindfulness intervention was beneficial for low-income ethnic minority youth in reducing perceived stress and internalizing problems, and improving emotion regulation outcomes. (Fung et al. 2018) Yet another qualitative analyses of an MBSR intervention conducted amongst Latino families with developmentally delayed children further highlight avenues for improving the efficacy of MBSR for Latino families by providing intervention directly in Spanish, rather than using translation services for Spanish-speaking families. Findings highlight the efficacy of MSBR for Latino parents of children with developmental delays, and underscore the potential benefits of disseminating this practice to traditionally underrepresented families. (Mathis et al. 2018) Other studies have looked at acceptability and feasibility of MBSR amongst low SES participants and have determined that the MBSR intervention is both acceptable and feasible with some cultural and language modifications. (Kabat Zinn et al, 2016, Erickson et al 2016, Neece et al. 2018)

A point of access for mindfulness in this population could be integrating mindfulness into their community. For example many respondents from the street or shelter do have free time and the willingness to engage in mindfulness, however it is not accessible in their community. There are often challenges with transportation, however, many would be able to engage with the practice if it took place in the shelter or somewhere in their immediate neighborhood. Additionally, many participants of this study emphasized they did have free time while at the shelter or on the street and wanted to do something positive or beneficial for themselves.

One limitation of this study is the small sample size. The qualitative results might not be uniform for all low SES individuals in Rhode Island, or generalizable to other cities within the United States. Another limitation is that participants were approached by the interviewer and offered at giftcard to participate, which may have biased some of the responses as the interviewees were more interested in talking to the interviewer than in participating in mindfulness. Strengths of the paper are the diverse responses across multiple sites in Providence from which participants were recruited, and performing qualitative mindfulness research in low SES populations, which are a uniquely understudied demographic group.

In conclusion, future research should focus on clarifying what mindfulness means or exploring ways to communicate with diverse populations to explore whether mindfulness would be beneficial. More tangible examples of what mindfulness is could be useful and an explanation of the ways it could be applied to their lives, such as helping with the ability to find or secure a job, learning to read, or accessing food or shelter. Perhaps more examples and hands on demonstrations could be provided to show what mindfulness is and what is meant in practice by

the term to improve understanding in low SES settings. How mindfulness can benefit this population can be further explored through a community-based participatory research approach.

References

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144-156.

Kabat-Zinn, J. (1990). Full catastrophe living. New York: Bantam Dell.

Jon Kabat Zinn, Fernando de Torrijos, Anne H. Skillings, Melissa Blacker, George T. Mumford, Danielle Levi Alvares, Saki Santorelli, Milagros C. Rosal. Delivery and Effectiveness of a Dual Language (English/Spanish) Mindfulness Based Stress Reduction (MBSR): Program in the Inner City A Seven Year Experience: 1992 1999. Mindfulness & Compassion 1 (2016) 2-13.

Gotink RA, Chu P, Busschbach JJ, Benson H, Fricchione GL, Hunink MG. Standardised mindfulness-based interventions in healthcare: an overview of systematic reviews and meta-analyses of RCTs. PLoS One. 2015 Apr 16;10(4):e0124344. doi: 10.1371/journal.pone.0124344. eCollection 2015. Review. PMID 25881019

Abercrombie PD, Zamora A, Korn AP. Lessons learned: providing a mindfulness-based stress reduction program for low-income multiethnic women with abnormal pap smears. Holist Nurs Pract. 2007 Jan-Feb;21(1):26-34. PMID 17167329.

Adler, N. E., Boyce, T., Chesney, M., S, C., Folkman, S., L, K., & Syme, S. L. (1994). Socioeconomic status and health. *American Psychologist*, *49*, 15224.

Bishop, S. R. , Lau, M. , Shapiro, S. , Carlson, L. , Anderson, N. C. , Carmody, J. , et al. (2004). Mindfulness: A proposed operational definition. Clinical Psychology: Science and Practice, 11, 230-241.

Clarke TC, Barnes PM, Black LI, Stussman BJ, Nahin RL. Use of yoga, meditation, and chiropractors among U.S. adults aged 18 and over. NCHS Data Brief, no 325. Hyattsville, MD: National Center for Health Statistics. 2018.

Dutton MA, Bermudez D, Matas A, Majid H, Myers NL. Mindfulness-Based Stress Reduction for Low-Income, Predominantly African American Women With PTSD and a History of Intimate Partner Violence. Cogn Behav Pract. 2013 Feb 1;20(1):23-32. PMID 24043922.

Nyklíček I, Mommersteeg PM, Van Beugen S, Ramakers C, Van Boxtel GJ. Mindfulness-based stress reduction and physiological activity during acute stress: a randomized controlled trial. Health Psychol. 2013 Oct;32(10):1110-3. doi: 10.1037/a0032200. Epub 2013 Mar 25. Erratum in: Health Psychol. 2014 Sep;33(9):1045. PMID 23527521.

Palta P, Page G, Piferi RL, Gill JM, Hayat MJ, Connolly AB, Szanton SL. Evaluation of a mindfulness-based intervention program to decrease blood pressure in low-income African-American older adults. J Urban Health. 2012 Apr;89(2):308-16. PMID 22302233.

Roberts L, Montgomery S. Mindfulness-based Intervention for Perinatal Grief Education and Reduction among Poor Women in Chhattisgarh, India: a Pilot Study. Interdiscip J Best Pract Glob Dev. 2016 Apr;2(1). pii: 1. PMID 28357415.

Szanton SL, Wenzel J, Connolly AB, Piferi RL. Examining mindfulness-based stress reduction: perceptions from minority older adults residing in a low-income housing facility. BMC Complement Altern Med. 2011 May 31;11:44. doi: 10.1186/1472-6882-11-44. PMID 21627807.

Erickson et al. The Health Effects of a Mindfulness Intervention Adapted for Hispanic Primary Care Patients. Psychosomatic Medicine 2016 78 :3 (A102).

Watson-Singleton N.N., Black A.R., Spivey B.N. Recommendations for a culturally-responsive mindfulness-based intervention for African Americans. *Complementary therapies in clinical practice,* 2019. 34 (132-138).

Fung J., Kim J.J., Jin J., Chen G., Bear L., Lau A.S. A Randomized Trial Evaluating School-Based Mindfulness Intervention for Ethnic Minority Youth: Exploring Mediators and Moderators of Intervention Effects. *Journal of abnormal child psychology* 2019 47:1 (1-19).

Jastreboff A.M., Chaplin T.M., Finnie S., Savoye M., Stults-Kolehmainen M., Silverman W.K., Sinha R. Preventing Childhood Obesity Through a Mindfulness-Based Parent Stress Intervention: A Randomized Pilot Study. *Journal of Pediatrics* 2018 202 (136-142.e1).

Mathis E.T., Shapiro A., Hawkins J.T., Charlot-Swilley D., Lingo K.J., Spencer T., Trachtenberg D., McPherson S.K.L., Domitrovich C.E., Biel M.G. Cultivating Mindfulness in Parents of Young Children: Effects of a Mindful Parenting Intervention Pilot in a Low-Income Community. *Journal of the American Academy of Child and Adolescent Psychiatry* 2018 57:10 *Supplement* (S148-).

Mathis E.T., Robertson H.A., Domitrovich C.E., Hawkins J.T., Biel M.G. Training in mindful parenting skills: A feasibility pilot with effects on mindfulness, mood, and parenting in a low-income sample. *Journal of the American Academy of Child and Adolescent Psychiatry* 2017 56:10 (S154-S155)

Burnett-Zeigler I.E., Satyshur M.D., Hong S., Yang A., T Moskowitz J., Wisner K.L. Mindfulness based stress reduction adapted for depressed disadvantaged women in an urban Federally Qualified Health Center. *Complementary therapies in clinical practice* 2016 25 (59-67)

Appendix 1: Interview Guide for Qualitative Interviews

Semi-Structured Script and Talking Points

Begin by going through the informed consent process using the IRB approved bulleted consent form. Make sure to answer participant's questions and to provide them with a hard copy of the informed consent form.

TALKING POINTS –

- **Confidentiality**: As a reminder, everything you say will remain confidential. No one outside of our project will be able to see your answers and your name and other identifying information will not be used in any reports or publications.
- **Why and How?** We are hoping to get your feedback about your experiences with and perceptions of mindfulness. Please feel free to share your point of view and know that we welcome both positive and negative feedback. There are no right or wrong answers.
- **Suggestions:** With your permission we would like to record this conversation so that it can be transcribed and analyzed. If you would prefer not to be recorded, please let me know. Also, please understand that any report we write regarding your feedback and what we hear from you today will not be identified with you in any way and remains anonymous.

  Suggestions to help us have a good discussion
  - Speak up
  - Audio recording if that is ok
  - Any report that we write about what we hear today will not be associated with your identity
  - There are no right or wrong answers.
  - Feel free to ask questions at any time. There are no bad, or stupid questions.
- **What to expect:** Before we begin I just want to let you know that we will be asking you a series of open ended questions. My role is listen and ask questions to better understand your experiences. So I might ask you for clarification or more detail about a comment but your thoughts are the important part of this discussion. However, in the interest of getting to all the questions I may need to move us along pleas know that this is only due to time considerations.
  - My role is to listen ask questions that help to understand your experience
  - In the interest of time, I may move to the next question to get your thoughts regarding the whole program

Any questions before we begin? Do you consent to having the conversation recorded?

As part of the research study we are interested in understanding your thoughts, feelings, and previous experiences with mindfulness.

1. When you hear the word 'mindfulness' what do you think of?

Mindfulness can be described in different ways, but it is often considered to be "paying attention, on purpose, in the present moment, non-judgmentally".

2. Keeping this definition in mind, on a scale of 1-10, where 1 is not interested at all, and 10 is extremely interested (show participant a Likert scale from 1-10), how interested are you in learning more about mindfulness?

   Probes: *Please share with me why you feel this amount of interest in learning about mindfulness.*

As part of this project, we are trying to learn more about what kinds of people are interested in learning about mindfulness, and if you are interested, better understanding how mindfulness training might be best delivered to you.

At this time I want to get your thoughts on a few different mindfulness programs that are currently being offered. There are quite a few different kinds of mindfulness programs these days. One is a 9 week course that includes a 2.5-hour session once each week and an all-day mindfulness retreat. It trains people how to meditate, and how to apply mindfulness skills to health conditions and stressors in their day-to-day lives. It takes place in a group setting.

3. On a scale of 1-10, where 1 is not interested at all, and 10 is extremely interested (show participant a likert scale from 1-10), how interested are you in taking this kind of a mindfulness course?

   Probe: *Please share with me why you feel this amount of interest in taking this mindfulness program.*

   Probe: What appeals to you? What might hinder your participation? Does the length of the course impact your decision to participate? Is so, what would be an ideal length for you?

Another way people often learn about mindfulness is online for a similar amount of time. For example, on a computer online with a live teacher interacting with you and other students.

4. On a scale of 1-10, where 1 is not interested at all, and 10 is extremely interested (show participant a Likert scale from 1-10), how interested are you in taking an online mindfulness course?

   Probe: *Please share with me why you feel this amount of interest in taking this mindfulness program.*

   Probe: *What makes learning mindfulness online more or less interesting compared to learning in-person?*

One more way people can learn about mindfulness is via an app on their phone. The apps often deliver brief mindfulness lessons or guided meditations, but usually don't have much if any interaction with a live person.

5. On a scale of 1-10, where 1 is not interested at all, and 10 is extremely interested (show participant a likert scale from 1-10), how interested are you in taking a mindfulness course via a phone app?

   Probe: *Please share with me why you feel this amount of interest in taking this mindfulness program.*

   Probe: *What makes learning mindfulness by a phone app more or less interesting compared to learning in-person?*

A final way people can learn about mindfulness is via what we call a "flipped classroom" where they may learn some of the more straight-forward lessons using an app on their phone, or computure. Then for a smaller amount of time, they come to a classroom and learn from a teach, often in a group, and get indivudalized feedback on their experience.

6. On a scale of 1-10, where 1 is not interested at all, and 10 is extremely interested (show participant a likert scale from 1-10), how interested are you in taking a mindfulness course via this kind of "flipped classroom" approach?

   Probe: *Please share with me why you feel this amount of interest in taking this mindfulness program.*

   Probe: *What makes learning mindfulness by a flipped classroom approach more or less interesting compared to learning in-person, online or via an app?*

The last questions we have are about the course structure and instructor.

1. How important is it for you to have an instructor of your own race or ethnicity if you were to participate in a mindfulness-based intervention?

Probe: *Why?*

2. How important is it for you to have an instructor speaking your own first language if you were to participant in a mindfulness-based intervention?

Probe: *Why?*

3. If you were going to participate in a mindfulness program, what is your typically availability during the week, including typical days or hours of the day?

4. How much would transportation influence your ability to participate in an in-person mindfulness intervention?

Any other closing thoughts or questions?